Report

San Francisco Public Utilities Commission

Lake Merced Watershed Sanitary Survey

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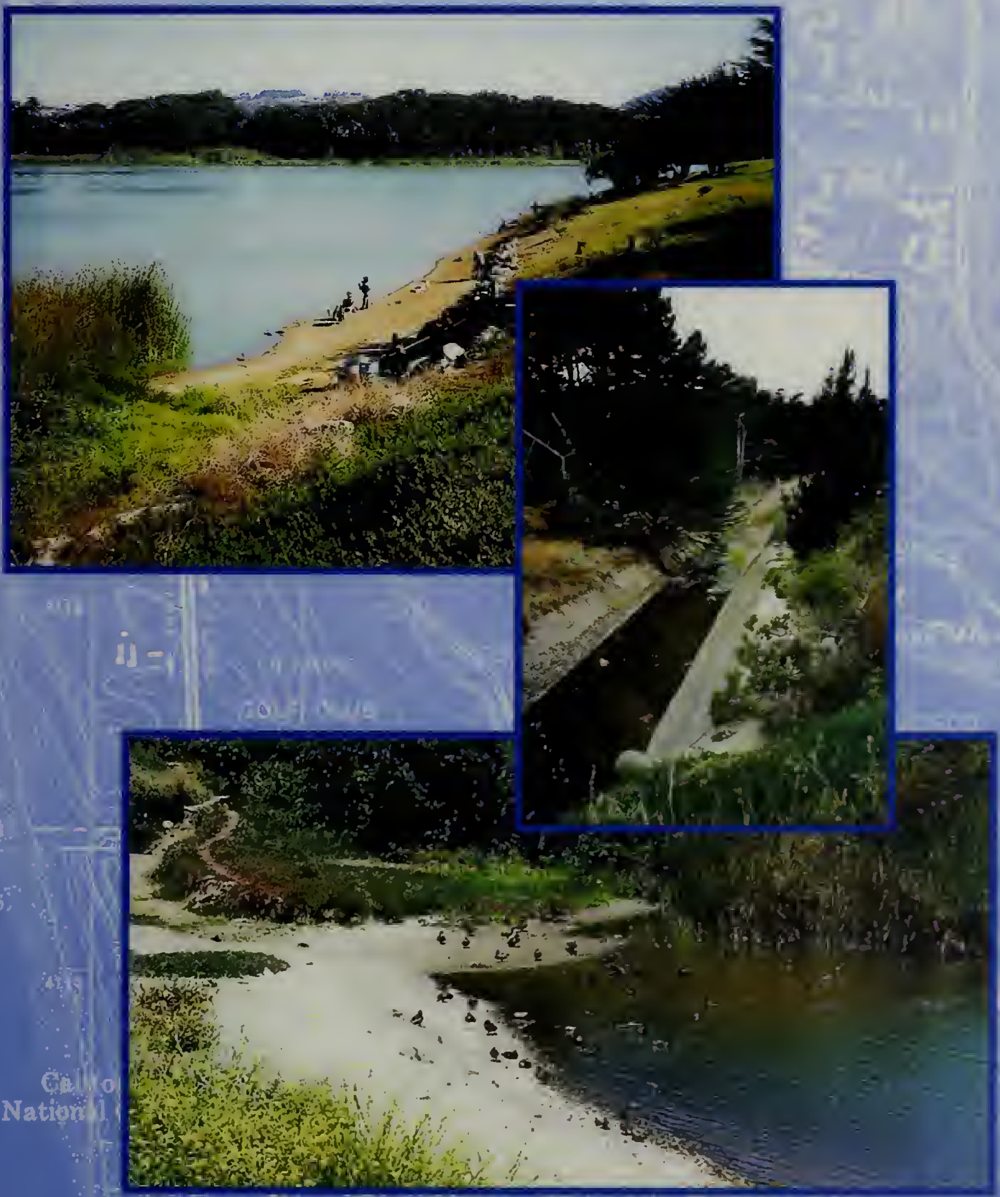

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Michael Carlin
San Francisco Public Utilities Commission
System Planning Environment and Compliance
1212 Market Street
San Francisco, CA 94103

Subject: *Lake Merced Watershed Sanitary Survey*

Dear Mr. Carlin:

This Watershed Sanitary Survey Report for Lake Merced and its surrounding watershed has been prepared as an element of the Draft Lake Merced Comprehensive Management Plan. The purpose of this report is to identify potential pollution sources that might effect Lake water quality. Recommendations were developed for contaminant source identification and removal, watershed management practices, Lake water quality monitoring, and program and infrastructure improvements to enhance Lake quality for its identified beneficial uses: water supply, recreation and wildlife.

We would like to thank the many City and County of San Francisco staff, public citizens, and technical consultants that contributed their understanding of Lake Merced and its watershed to this report. We extend special thanks to Ms. Joan Ryan and Ms. Katie Miller (San Francisco Public Utilities Commission) for coordinating City and public information and for providing an in-depth knowledge of the Lake's resources.

It has been a pleasure assisting the City and County of San Francisco with this project. If you have any questions regarding this report, please call.

Sincerely,

CAMP DRESSER AND McKEE INC.

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List of Abbreviations

ac-ft/yr	acre-feet per year
AWWA	American Water Works Association
Basin Plan	San Francisco Bay Basin Water Quality Control Plan (1995)
BERM	Bureau of Environmental Regulation and Management
bgs	Below ground surface
BMP	Best Management Practice
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
cfs	cubic feet per second
The City	The City and County of San Francisco
CDS	Continuous Deflection Separation
CMP	Comprehensive Management Plan
CU	color unit
DFG	California Department of Fish and Game
DHS	California Department of Health Services
DTSC	Department of Toxic Substances Control
EDR	Environmental Data Resources, Inc.
gpm	Gallons per minute
HPMGC	Harding Park and Jack Fleming Municipal Golf Courses
The Lake	Lake Merced
LMCS	Lake Merced Control Structure
LMPS	Lake Merced Pump Station
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level
mgd	Million gallons per day
mg/l	Milligrams per liter
mil.V	millivolts
MPN/100ml	Most probable number per 100 milliliters
MTBE	Methyl tertiary-butyl ether
No/cuM	Number per cubic meter
NSMCSD	North San Mateo County Sanitation District
NTU	Nephelometric turbidity units
O&G	Oil and grease
OWPCP	Oceanside Water Pollution Control Plant
PAH	Polyaromatic hydrocarbon
PCB	Polychlorinated biphenyl
PEA	Preliminary Endangerment Assessment
ppm	Parts per million
Sanitary Survey	Sanitary Survey
SFDPH	San Francisco Department of Public Health
SFFD	San Francisco Fire Department
SFPD	San Francisco Police Department
SFPUC	San Francisco Public Utilities Commission
SFRPD	San Francisco Recreation and Park Department

SFSU	San Francisco State University
SPARC	System Planning and Regulatory Compliance
SPEAC	System Planning, Environment, and Compliance
SVWC	Spring Valley Water Company
SWTR	Surface Water Treatment Rule, 1991
TDS	Total Dissolved Solids
TM	Technical Memoranda
TOC	Total organic carbon
ug/l	micrograms per liter
umhos	microhms
us/cm	microhms per centimeter
USGS	United States Geological Survey
UST	Underground storage tank
Westside Basin	Westside Groundwater Basin
WPPP	Water pollution prevention program
WQB	Water Quality Bureau

Executive Summary

Executive Summary

The Lake Merced Watershed Sanitary Survey (Sanitary Survey) was conducted to meet one of the three water resources program goals in the Draft Lake Merced Comprehensive Management Plan (CMP). Goal 3 of the Draft Lake Merced CMP Water Resources Program is to "protect and enhance water quality for the appropriate, identified beneficial uses." The San Francisco Bay Basin Water Quality Control Plan (Basin Plan) sets forth six beneficial uses for Lake Merced (California Regional Water Quality Control Board, 1995). The Draft Lake Merced CMP has grouped these uses into three categories: potential municipal water resource, regional recreation resource, and significant natural resource and education area (SFPUC/SFRPD, 1997).

The California Department of Health Services (DHS) typically requires that a sanitary survey be completed for each watershed which is a drinking water source. Lake Merced (the Lake) is currently managed by the San Francisco Public Utilities Commission (SFPUC) as an alternative emergency water resource rather than a drinking water source, to be used during an emergency primarily for firefighting and to maintain pressure in the SFPUC distribution lines. The water supply facilities at Lake Merced do not include any permanent disinfection or filtration capability. Although the sanitary survey is not needed to meet DHS requirements, it is critical to understanding the sources and quality of water flowing into the Lake. The survey also provides a baseline information source for protecting and enhancing water quality, as well as identifying potential watershed management needs to maintain and improve water quality.

The survey included a number of field visits to identify current activities both at the Lake and within the watershed. The survey also included a review of existing reports to identify actual and potential sources of contamination in the watershed. Recent water quality monitoring data was acquired for the Lake and each of the Lake's water sources, including groundwater, stormwater, and SFPUC imported potable surface water. The findings are summarized in figures and tables in this report.

In this survey, the key contaminants of concern identified at the Lake include nutrients, coliforms, metals, pesticides/herbicides, chlorine residual, and sediments. The potential effects and sources of each of these contaminants are listed on Table ES-1.

Table ES-1
Contaminants of Concern in the Lake Merced Watershed

Contaminants of Concern	Potential Effects	Potential Sources of Contaminants
Nutrients (Nitrogen, Phosphorus)	Increased potential for algae blooms in Lake	Stormwater runoff, combined sewer overflow, groundwater
Coliforms	Indication of waste contamination, potential for viruses and health hazards	Stormwater runoff, combined sewer overflow, groundwater, natural biological activity
Metals	Toxic for plant and animal life	Stormwater runoff, combined sewer overflow, groundwater
Pesticides/Herbicides	Toxic for plant and animal life	Stormwater runoff, groundwater
Chlorine residual	Toxic to aquatic life	Drinking water discharge
Sediments	Can carry contaminants, nutrients	Stormwater runoff
Litter, debris	Detrimental to plant and animal life	Recreation, illegal activities

Based on the survey findings, there were no significant contamination sources within the watershed. However, a number of potential sources that could contaminate Lake Merced were identified. These include:

- Transport of contaminants by groundwater,
- Stormwater runoff,
- Combined sewer overflows,
- Pesticide and herbicide misuse,
- Water blowoff from treated water pipelines without dechlorination,
- Recreational activities causing litter, erosion, or other water quality degradation,
- Spills created by accidents along the roadways surrounding the Lake.

Recommendations

The recommendations are divided into three sections: watershed management, water quality monitoring, and program and infrastructure recommendations.

Watershed Management Recommendations

Most of the ongoing Lake Merced watershed management efforts are performed by different divisions or bureaus under the SFPUC or under the San Francisco Recreation and Park Department (SFRPD). This separation of responsibilities creates difficulties in coordinating a watershed management program. The following recommendations are made:

- Establish the division or agency with overall responsibility for watershed management and specifically define the management responsibilities of each division for the Lake Merced watershed.
- Evaluate funding mechanisms to finance watershed management and maintenance activities around Lake Merced.
- Establish a watershed management plan which includes the activities identified in Table ES-2.
- Perform a study and field inspection to review the potential for contamination from the possible combined sewer overflow locations which are adjacent to the Lake.
- Perform a study and field inspection to review stormwater runoff sources that drain into the Lake.

Table ES-2
Recommended Components of Watershed Management Plan

Type of Component	Description of Component
Water Quality Evaluation Program	Establish an integrated water quality evaluation program. This program would store and evaluate all water quality data and hydrology information that is collected. The information would then be available in an easily accessible format for evaluating the effects of future changes to the Lake, such as changes in mixing between the individual lakes, increased potable water additions, and treated stormwater discharge.
Maintenance and Surveillance	Increase maintenance and surveillance at the Lake. The limited maintenance at the Lake has resulted in frequent deposition of trash and debris, and the potential for illegal activities and dumping around the Lake. Additional staff or volunteers could be used for maintenance activities within the Lake watershed.
Public Education/Involvement	Implement an aggressive public education/involvement program to minimize future contaminant loading to the Lake. The program may include additional signage at the Lake and educational pamphlets which may be mailed out or distributed at the concessionaires and lessees of the Lake.
Implementation of Feasible Management Practices	Continue investigation and implementation of feasible management practices. While good management is generally observed in the Lake Merced watershed, the effort could be improved through developing a list of best management practices (BMPs) that are specific to Lake Merced. The CMP contains some desired BMPs, as do the existing lease agreements with tenants. These should be strengthened by developing and then implementing a unique list of BMPs for watershed management.

Water Quality Monitoring Recommendations

Water quality information pertaining to the Lake and its water sources is currently collected and maintained by two SFPUC divisions, the Water Quality Bureau (WQB) and the Bureau of System Planning, Environment, and Compliance (SPEAC). One water source, groundwater, is not monitored on a systematic basis. Although the collaborative collection of data provides a wealth of water quality information for Lake Merced and the surrounding areas, the data is not regularly evaluated for underlying trends. It would be beneficial to develop and evaluate ongoing trends and summaries of the water quality data to determine the impact of watershed activities. With regular analysis of water quality data, a quick response to changes in watershed activity can be developed by the SFPUC to protect water quality.

The water quality monitoring program would be an integral part of the watershed management plan. The following recommendations regarding water quality monitoring are made:

- Identify a Division or Bureau which will be responsible for management of the water quality information gathered for Lake Merced.
- Develop an inter-division monitoring and database system which can be used by all divisions for data input and analysis. Allow easy accommodation of new types of data.
- Evaluate the data on a frequent basis (e.g. annually) to identify any adverse or improving trends and the underlying cause(s) of significant changes. Use data to evaluate impact of different source water additions and seasonal effects in each of the lakes.

- Store the data in a database format.
- Compare water quality with water hydrology and movement in each of the three separate lakes.
- Modify existing Lake water quality monitoring program to include:
  - annual herbicide/pesticide analysis
  - monthly Oil and Grease (O&G) analysis
  - weekly total organic carbon (TOC) analysis
- Develop a water quality monitoring program for groundwater in the Lake Merced area.
- Create and maintain a current report of all investigated water quality trends and identify data comparison parameters for future analyses.
- Seasonally inspect golf courses during irrigation and rainfall to assess amount and locations of runoff into Lake Merced.
- Visually inspect stormwater runoff and drains during large storms to determine flow patterns, volume, and stormwater drains that terminate into Lake Merced.

Program and Infrastructure Recommendations

The following recommendations are made:

- Monitor frequency of overflow events at the Vista Grande Channel. Assure that adequate maintenance is provided to keep the grizzly structure from becoming clogged.
- Evaluate alternatives to treat and discharge Vista Grande stormwater into Lake Merced. Because of the potential damage from the stormwater overflows from the channel, the existing capacity of the system must be enlarged, or the water should be treated and directed to Lake Merced.
- Field verify structural integrity, operability, and gate elevation of the 30-inch overflow structure for Lake Merced. Make recommendations on future use.
- Unblock the culvert between North and South Lakes to allow less restricted movement of water between the lakes.
- Field inspect all combined sewer overflows to verify they have been disconnected. Perform dye tests when integrity is unknown.
- Field inspect stormwater runoff areas around the lake to verify discharge locations.
- Develop an Emergency Use Plan for methods of water use and watershed impacts during a fire or other emergency.
- Perform recreational usage study to assess adequacy of existing trash and restroom facilities. Make recommendations for increased maintenance, waste disposal, or heightened security, if needed.

1

Section One

Section 1
Introduction

The Lake Merced Watershed Sanitary Survey was conducted for the SFPUC SPEAC as part of the implementation of the Draft Lake Merced CMP prepared jointly by SPEAC and SFRPD. Conducting a sanitary survey for the Lake Merced watershed is specified as Action WRS-3.1 of Goal 3 of the Draft Lake Merced CMP. This goal identified that a watershed sanitary survey be performed to provide a baseline assessment of the water quality issues associated with Lake Merced, located in the southwest quadrant of the City and County of San Francisco, California (the City). The Sanitary Survey work included field surveys, a review of existing reports, a study of the potential sources of contamination in the Lake, an analysis of water quality data, and an assessment of watershed control and management practices.

1.1 Survey Requirements

The Sanitary Survey was prepared to coordinate with the Draft Lake Merced CMP. The report follows the guidelines and format set forth in the 1993 Draft Watershed Sanitary Survey Guidance Manual prepared by the American Water Works Association (AWWA). The Guidance Manual is also used for watershed sanitary surveys conducted for municipal water suppliers as required by DHS.

The sanitary survey's requirements are:

1. Characterize the watershed and water supply system.

2. Create an inventory of potential contaminant sources in the watershed.

3. Analyze available water quality data.

4. Describe watershed control and management practices.

5. Recommend corrective actions to maintain or improve water quality in the watershed.

1.2 Purpose and Scope of Survey

The watershed sanitary survey is critical to understanding the quality and quantity of water flowing into Lake Merced and will provide a baseline for protecting and enhancing water quality for the Lake's use as a potential municipal and domestic water supply source, recreation area, and natural wildlife habitat. The survey's objectives are to identify potential sources of contamination within the watershed that can degrade source water quality, summarize current baseline water quality conditions, and identify potential methods for improving water quality monitoring and control programs.

This sanitary survey covers Lake Merced and the surrounding area, generally bounded by Skyline Boulevard to the west, Lake Merced Boulevard to the north and east, and John Muir Drive to the south. Topographic maps were reviewed to delineate the historical watershed and sewer maps were obtained to determine the area of the historical watershed that is now diverted away from the Lake. Existing studies and data surveys of Lake Merced were collected to review

information pertinent to the watershed sanitary survey. Field visits were conducted to observe specific areas within the watershed where activities may have an adverse effect on Lake Merced water quality and to determine the degree to which water diversions away from the Lake are occurring. Possible contamination sources that were investigated include stormwater runoff, erosion, recreational activities, and non-point pollution sources.

1.3 Survey Limitations

In order to meet the purpose and scope of the survey with the available resources, the review and analysis of the information was subject to the following limitations.

- This sanitary survey is intended to be a snapshot of the conditions at the Lake at the current time. It does not include detailed research of past conditions; however, historical summaries are provided where pertinent to provide an understanding of water quality and supply issues.
- Information presented in the report is based solely upon the condition of the watershed on the dates of the field visits to the site. Information, data, estimates, opinions, and other references used to prepare this survey were obtained from sources considered reliable and believed to be true and correct.
- Watershed site inspection was limited to accessible areas.
- In some cases, records were not available, current, or did not accurately reflect field conditions. These deficiencies are listed with a recommendation that the SFPUC field verify or install recording devices in order to collect accurate data in the future.

1.4 Report Organization

This report follows the format recommended in the AWWA guidance manual (AWWA, 1993). Specific sections presented in this report are:

- *Section 1, Introduction:* Presents an overview of the watershed sanitary survey, including the requirements and scope of the project.
- *Section 2, Watershed and Water Supply System:* Provides a description of the historical and existing watershed, land use, and the water supply system operated by the SFPUC.
- *Section 3, Lake Merced Potential Contaminant Sources:* Describes the methodology of the sanitary survey and the identified potential sources of pollution to the Lake.
- *Section 4, Lake Merced Water Quality:* Provides a summary of existing water quality monitoring and results.
- *Section 5, Lake Merced Control and Management Practices:* Lists existing and potential regulations, policies, and practices for maintaining the watershed.
- *Section 6, Conclusions and Recommendations:* Presents recommendations for further identifying contaminant sources and improving watershed controls and water quality.

2

Section Two

Section 2
Watershed and Water Supply System

2.1 Description of Watershed

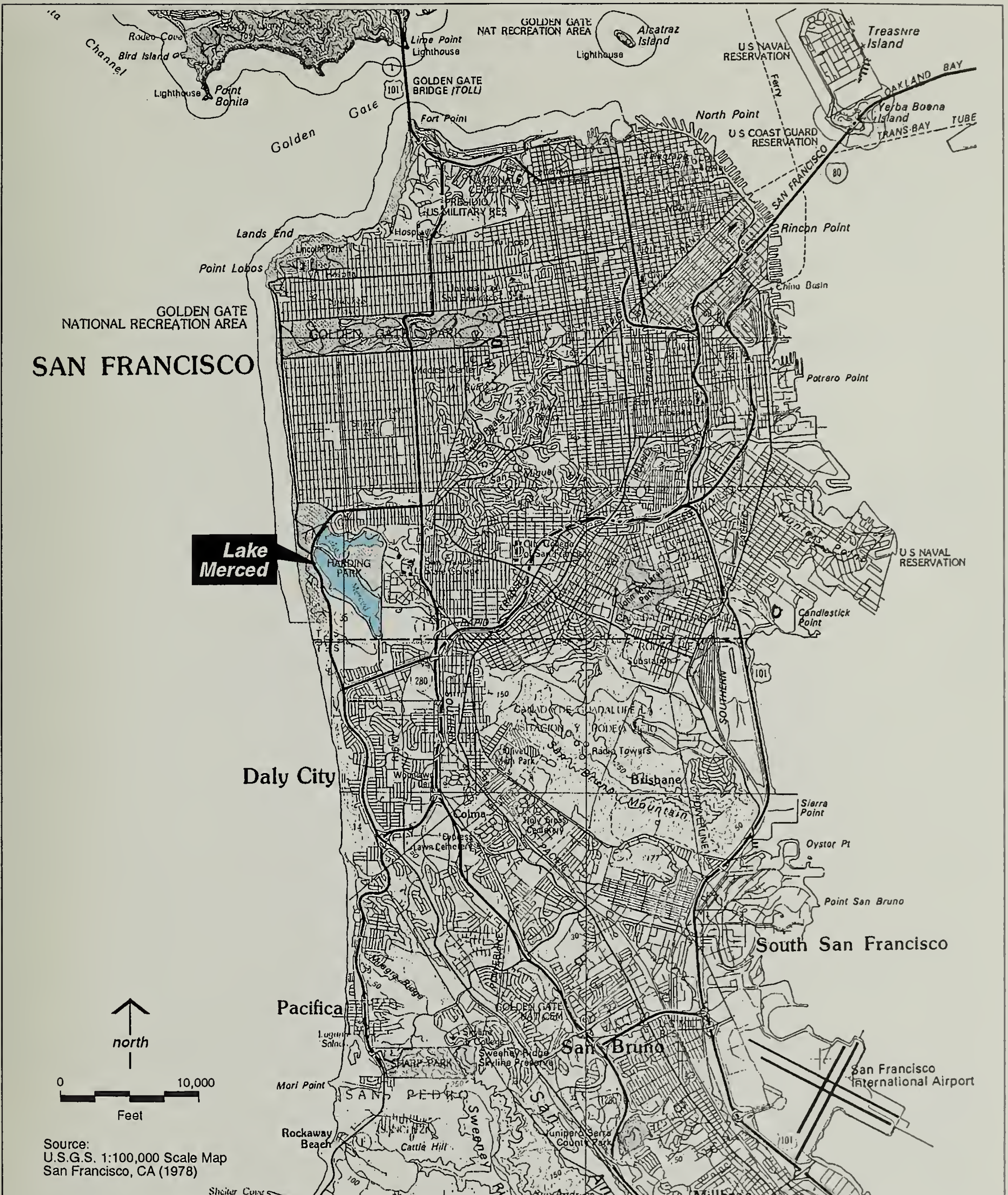
Lake Merced is located in the southwest corner of San Francisco, just north of the border of San Francisco and Daly City, as shown on Figure 2-1, Vicinity Map (see Appendix B, Photographs 1 and 2). San Francisco has an estimated population of 789,600 people, and Daly City a population of 103,400 (California Department of Finance, 1998). The approximate Lake Merced watershed boundary is delineated by streets immediately surrounding the Lake as shown on Figure 2-2: Lake Merced Boulevard, Skyline Boulevard, and John Muir Drive. The watershed is approximately 650 acres encompassing the Lake, Harding Park and Jack Fleming Municipal Golf Courses (HPMGC), Pacific Rod and Gun Club, Lake Merced Boating and Fishing Company, The Boathouse Restaurant, Lake Merced Pump Station (LMPS), San Francisco Police Department (SFPD) Range, and public recreation areas. The lands outside the roadway boundaries do not contribute runoff to the watershed. This runoff water is collected by San Francisco and Daly City's stormwater systems. The watershed overlays part of the Westside Groundwater Basin (Westside Basin). The Westside Basin extends from just north of Golden Gate Park to the San Francisco International Airport to the south. The eastern edge of the basin occurs at the bedrock features of Mt. Sutro, Twin Peaks, and the San Bruno Mountains. Lake Merced is currently fed by groundwater from the underlying aquifer, precipitation on the Lake surface, stormwater runoff in the watershed, and periodic direct addition of SFPUC imported potable surface water.

2.1.1 Pre-development Watershed

Prior to urban development, the Lake Merced watershed covered approximately 6,320 acres which encompassed the area presently bounded to the north near Herbert Hoover Junior High School, to the east near Mount Davidson and the City College of San Francisco, to the south into Daly City near Westmoor High School, and to the west generally along Skyline Boulevard, as shown on Figure 2-2. Once San Francisco and Daly City installed stormwater systems, much of the surface water that had previously drained into the Lake, by overland flow or groundwater transport, was carried into the stormwater conveyance systems away from the lake, eventually reducing the watershed to its current size. The boundaries of the pre-development and existing watershed are shown on Figure 2-2.

Lake Merced has undergone a significant evolution since it was formed more than 15,000 years ago. During the Wisconsin Glaciation, the last glacial period, streams in the San Francisco area flowed towards the Lake Merced area on their way to the Pacific Ocean. A bay was created at Lake Merced when sea level rose at the end of the glacial period. Lake Merced originated as a single body of salt water when the mouth of the bay was eventually closed up due to accumulations of sand which formed a barrier to the ocean. The Lake evolved into a freshwater body as the stream flow into the Lake diluted the salt water. (Archaeological Consultants, 1981)

An earthquake in 1852 destroyed the sand barrier and opened a channel to the ocean along what is now Sloat Boulevard. In 1895, an earthen dam was built to repair the barrier, and another earthen dam was constructed to separate North and South Lakes (Archaeological Consultants, 1981). A



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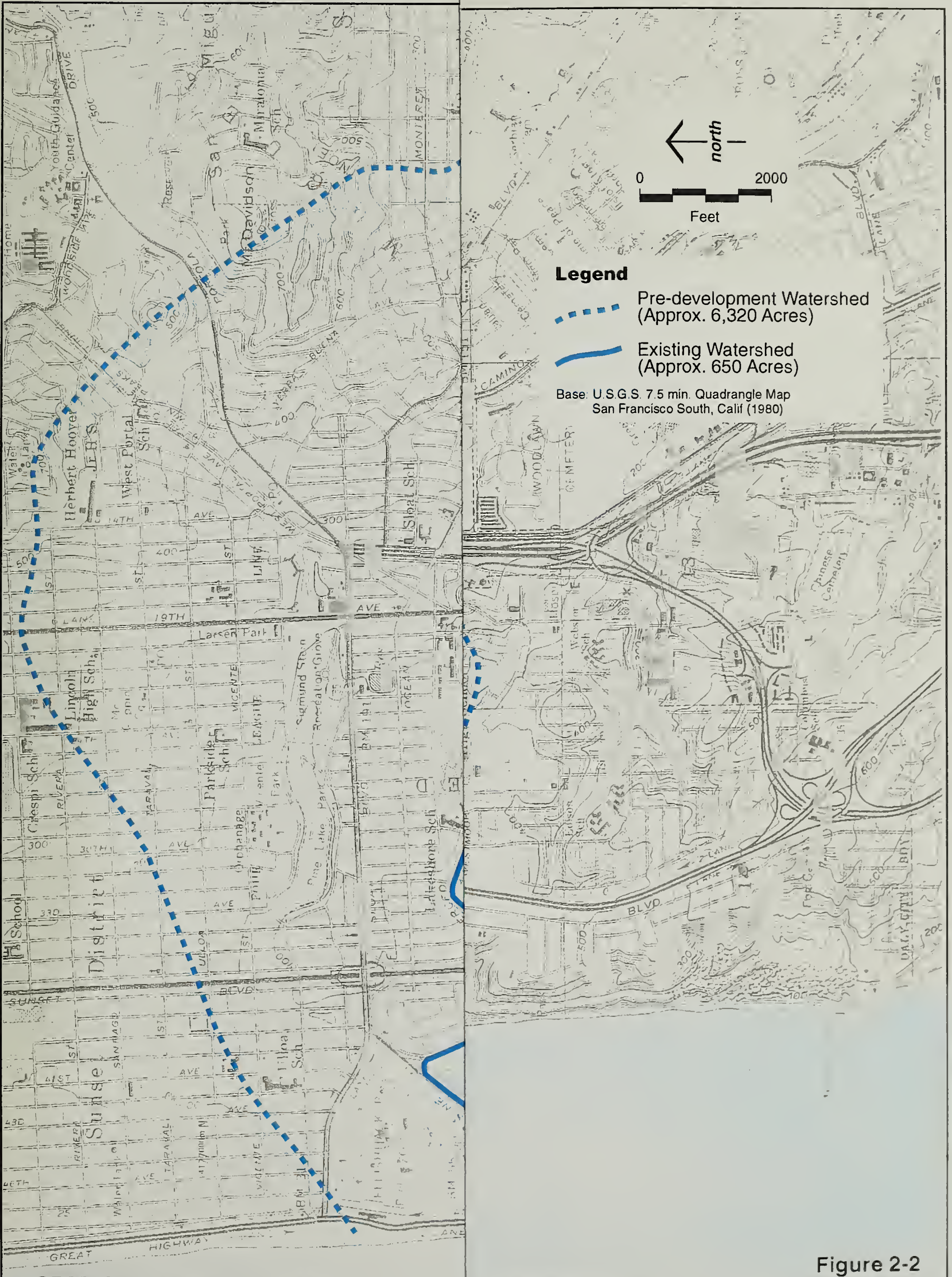
U.S.G.S. 1:100,000 Scale Map
San Francisco, CA (1978)

Figure 2-1
Vicinity Map



Base: U.S.G.S. 7.5 min. Quadrangle Map San Francisco South, Calif (1980)

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Figure 2-2
Pre-development and Existing Watershed

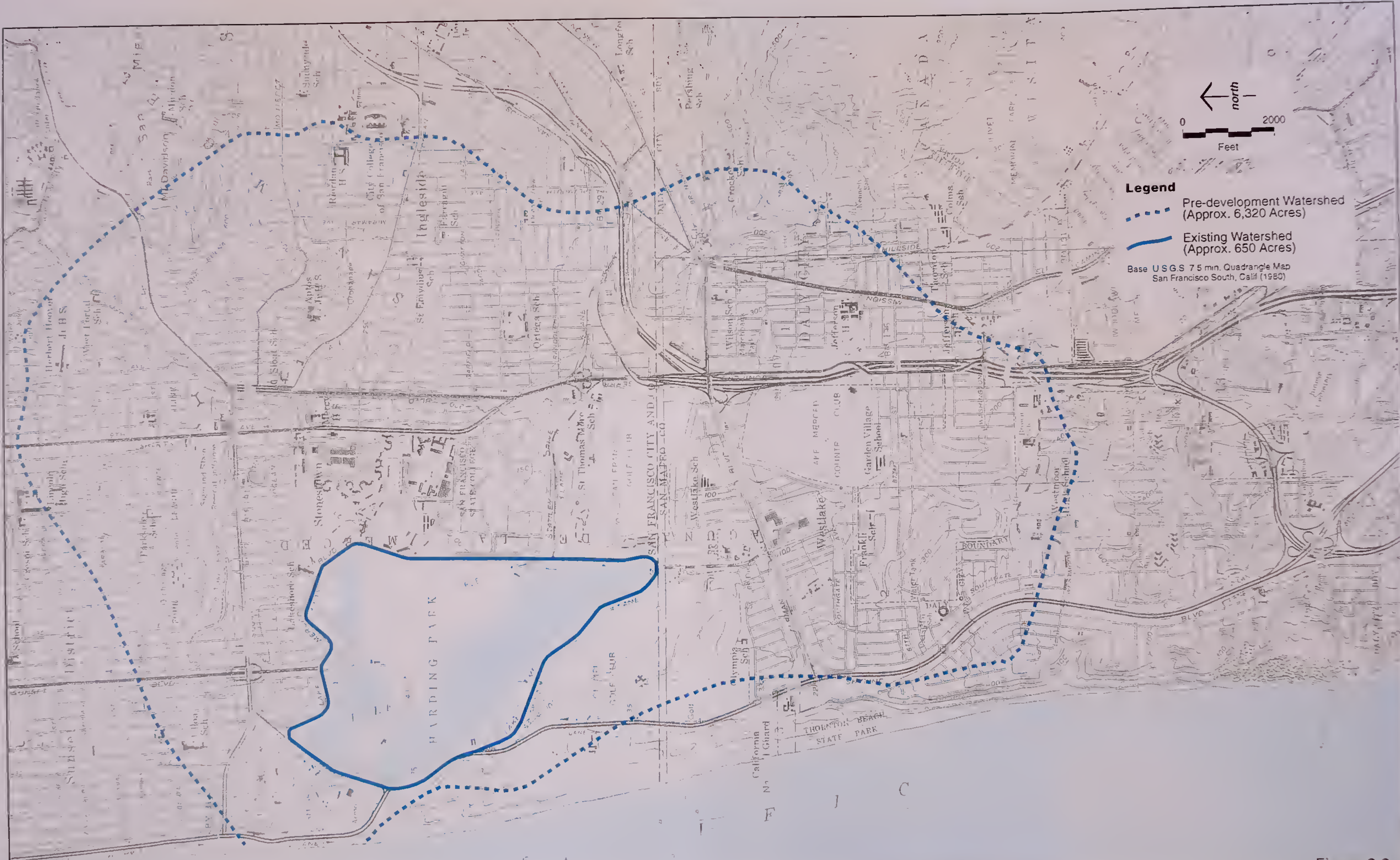
north
0
2000
Feet
Legend
Pre-development Watershed (Approx. 6,320 Acres)
Existing Watershed (Approx. 650 Acres)
Base U.S.G.S. 7.5 min. Quadrangle Map San Francisco South, Calif (1980)
HARDING PARK
SAN FRANCISCO CITY AND CO
SAN MATEO CO
DALY CITY
Stonestown
Westlake
Ingleside
THORNTON BEACH STATE PARK
BOUNDARY
BLVD
P A C I F I C

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Figure 2-2
Pre-development and Existing Watershed

culvert was constructed in 1927 through the North and South Lake dam allowing water to flow from one lake to the other in times of flooding or when water is pumped into South Lake. In 1950, a viaduct for three sanitary sewer lines was built across the southern end of South Lake creating Impound Lake.

Figure 2-3 presents an aerial photograph of the Lake Merced area in 1935. At that time, there was very little residential development between Sloat and Lake Merced Boulevards, in the present-day area of San Francisco State University (SFSU), and south of the Lake. Lake Merced Boulevard extended farther east around North Lake than it does currently. Harding Park Road was constructed on the dam separating North and South Lakes and leads to HPMGC. The 1935 photograph also shows Lake Merced before the viaduct was built separating South Lake from Impound Lake.

2.1.2 Land Use

Land use in the area outside of the current Lake Merced watershed but within the Westside Basin consists mainly of residential and recreational areas. As seen on Figure 2-4, Land Use in Surrounding Areas, residential housing surrounds the Lake to the north and south. Two golf courses lie outside the watershed boundary: Olympic Country Club and San Francisco Golf Club, south and southeast of the Lake, respectively. Also near the Lake are a number of public schools, shopping center, SFSU, the San Francisco Zoo, Oceanside Water Pollution Control Plant (OWPCP), and Fort Funston. Portions of the Golden Gate National Recreation Area also border the Lake to the west along Skyline Boulevard and to the east along Brotherhood Way.

The land immediately inside the roadway boundaries and thus within the watershed of Lake Merced is managed by SFRPD for recreational use. Figure 2-5 presents many of the recreational activity areas at the Lake, including picnicking, bicycling, boating, golfing, fishing, and skeet shooting. There are boat docks and fishing piers on both North and South Lakes. Visitors can bring their own boats to the Lake or rent boats for the day. Picnic areas are located along North and South Lakes. Skeet shooting opportunities are available through the Pacific Rod and Gun Club. The SFPD maintains a target practice range near the Pacific Rod and Gun Club. See Section 2.2, Beneficial Uses of Lake Merced, for more information on recreational activities.

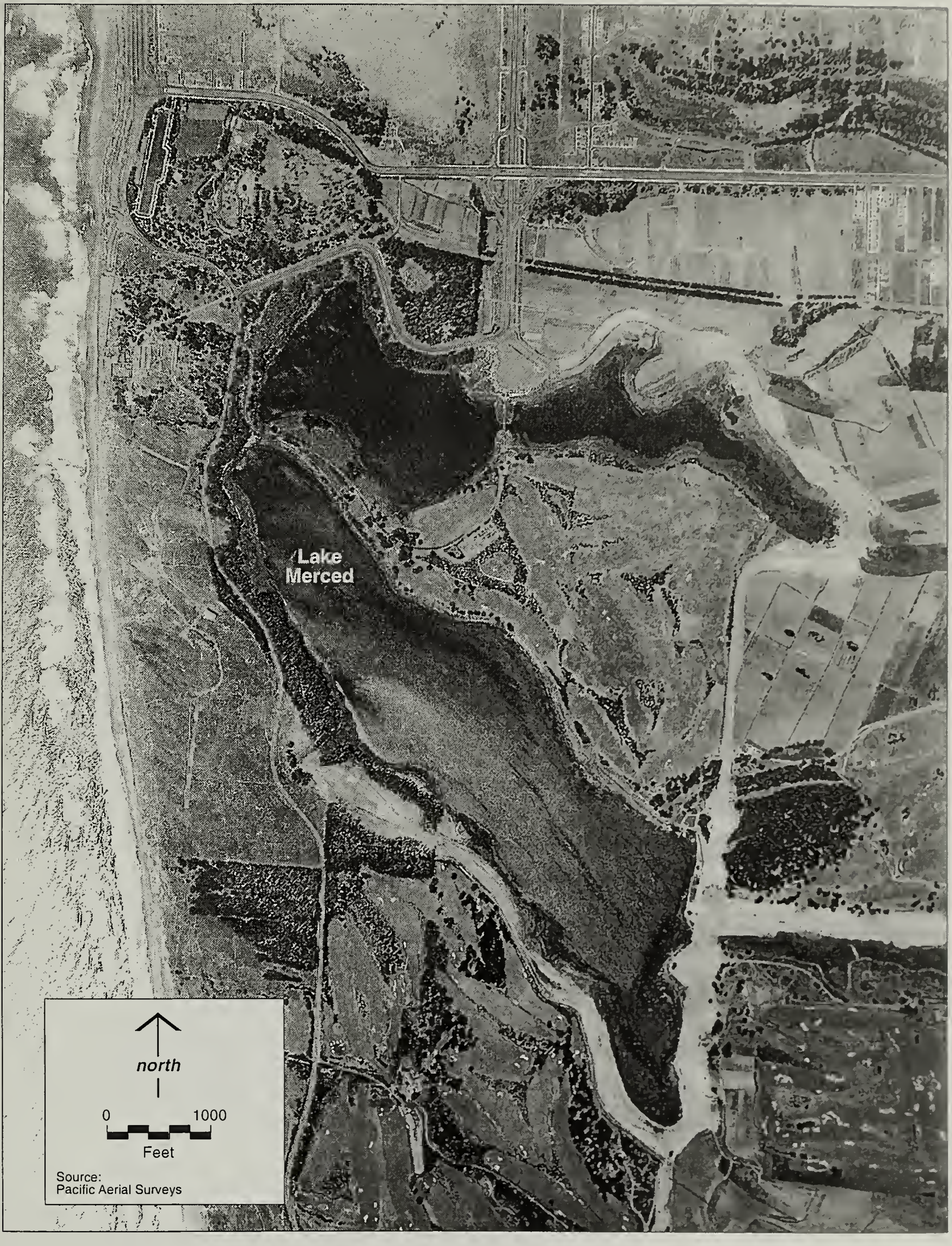
2.1.3 Natural Setting

Topography

Lake Merced is surrounded by steep banks ranging from approximately 20 to 55 feet in height with slope angles of up to approximately 30 degrees (USGS, 1980). North and South Lakes are separated by a gently to moderately sloping (6 to 7 degrees), elevated plateau (elevation range of approximately 25 to 90 feet San Francisco datum) dipping to the west. The plateau is approximately 3,000 feet wide on the east end and narrows to less than 200 feet on the west end (see Figure 2-2).

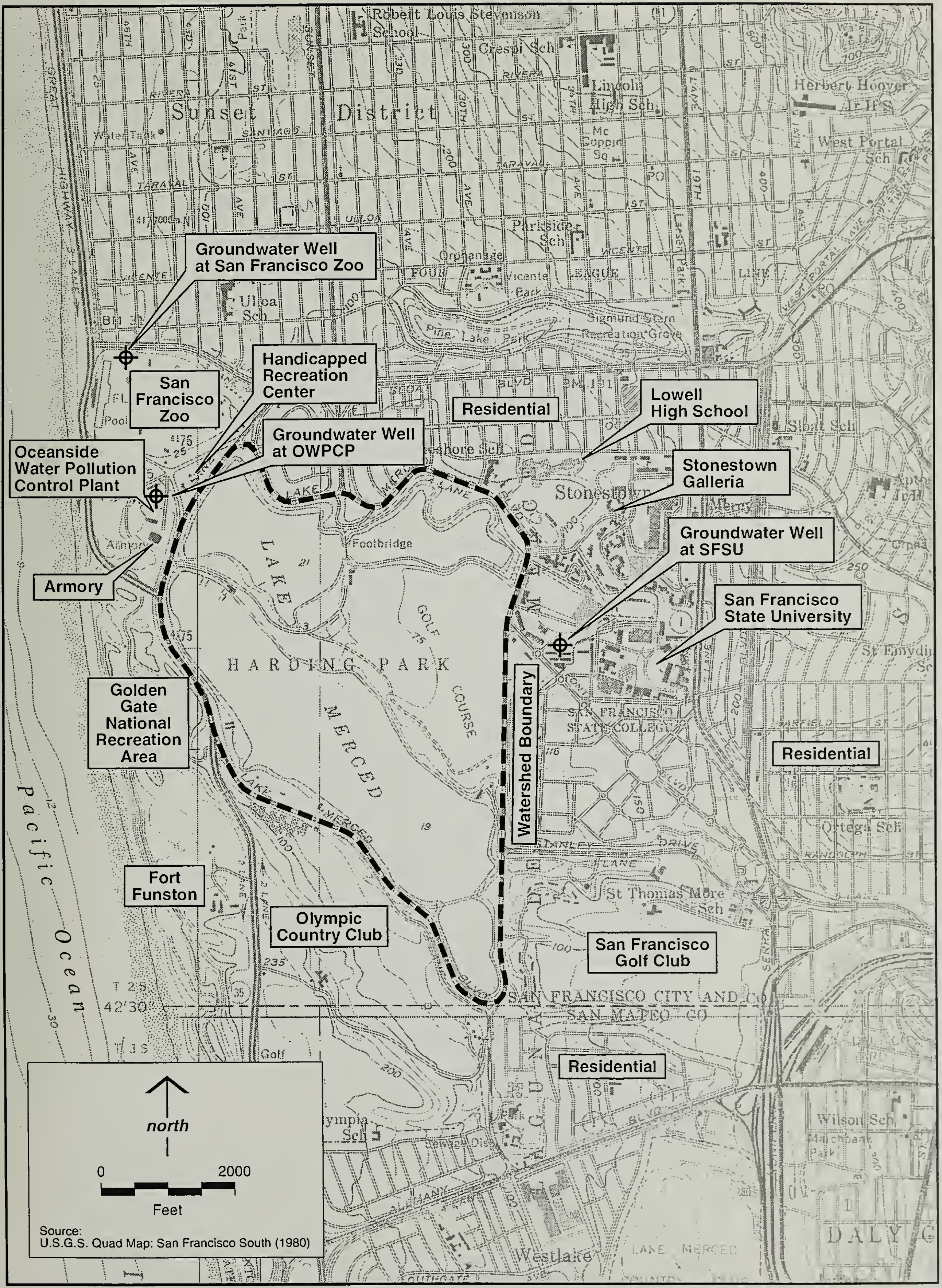
Geology

The Lake Merced area is primarily underlain by the Colma Formation which is comprised of fine- to medium-grained sand with minor amounts of sandy silt, clay and gravel interbeds (USGS, 1974). The sand is soft and friable. The United States Geological Survey (USGS) has mapped dune sand on the western edge of the Lake which is loose to soft and noncohesive.



Source:
Pacific Aerial Surveys

Figure 2-3
1935 Aerial Photograph of the Lake Merced Area



Source:
U.S.G.S. Quad Map: San Francisco South (1980)

Figure 2-4
Land Use in Surrounding Areas

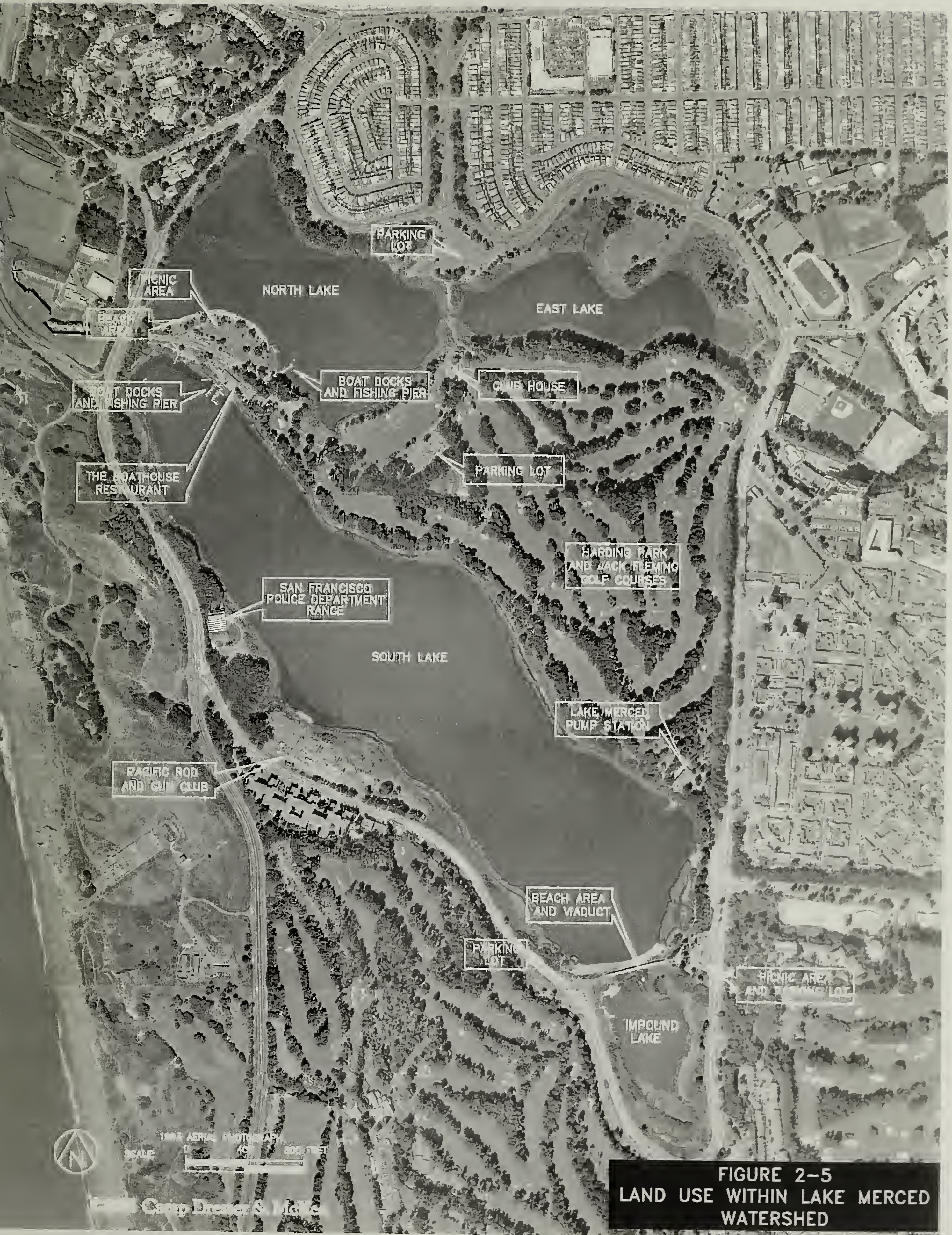


FIGURE 2–5
LAND USE WITHIN LAKE MERCED
WATERSHED

The Colma Formation is of Pleistocene age, meaning it was deposited within the last two million years. As such, deposits of the Colma Formation are poorly consolidated giving them more the characteristic of "soil" than "rock". Stronger, more competent rock of the Franciscan Complex underlies the Colma Formation at depths that may range between 200 and 2,000 feet below ground surface (bgs). The broad depth range at which the Franciscan rock may occur is attributable to the San Bruno Fault which has been mapped through the heart of the site in a northwest trending direction. Whereas the San Bruno Fault has been considered inactive (California Division of Mines and Geology, 1975), displacement along the fault during geologic time apparently has resulted in a relative downward movement of the Franciscan bedrock on the west side of the fault to depths of up to about 2,000 feet bgs (USGS, 1961).

Soils

Soil at Lake Merced consists of sand, loamy sand, and sandy loam. Clean sand soil is expected in areas where dune sand has been mapped along the western side of the Lake. Soil overlying the Colma Formation is expected to consist of loamy sand and sandy loam, with varying amounts of clay depended on soil horizon development. Clean sand would be easily eroded where exposed on slopes during heavy rain events. However, sediment transport would require fast moving water since the sand is not easily suspended. Loamy sand and sandy loam is less erodible due to the cohesiveness of the soil, but once entrained, suspended clay and silt sediment will persist even in slow moving water.

Additional information on the geology, soil, and groundwater in the area of Lake Merced can be found in the Technical Memoranda (TM) of the San Francisco Groundwater Master Plan, specifically Draft TM4 Groundwater Resources (CH2M HILL/AGS, 1996).

Climate

Lake Merced is located in the southwest corner of San Francisco west of the San Miguel Hills and San Bruno Mountain. San Francisco lies along the California Coast Ranges, which separate the Pacific Ocean from the San Joaquin and Sacramento Valleys. The area has a Mediterranean climate characterized by mild, wet winters and warm, dry summers. Winds from the Pacific Ocean maintain moderate temperatures (USGS, 1990). One hundred forty-nine years of precipitation data and 123 years of temperature data are available for San Francisco. San Francisco has an average annual temperature of 57.8 degrees Fahrenheit (°F) and average annual precipitation of 21.8 inches. Temperature extremes for the recording period are a high of 103°F in July 1988 and low of 27°F in December 1932 (Golden Gate Weather Service, 1998).

Wildlife

Lake Merced is the largest freshwater lake in San Francisco and as such supports a wide variety of plant and animal life. The Lake is able to sustain both wetland and upland species of vegetation and wildlife; 182 wildlife species are known or believed to occur at the Lake (Trihey & Associates/CDM, 1998). Birds are the pre-dominant wildlife species since Lake Merced lies along the Pacific Coast Flyway, making it a resting point for thousands of migratory birds each year.

Figure 2-6 presents wildlife habitats in the areas of the Lake Merced watershed, divided into tree-dominated, shrub-dominated, and herb-dominated habitats. In this report, plants and animals are grouped according to their habitat. The tree-dominated habitat is home to six kinds of trees: arroyo-

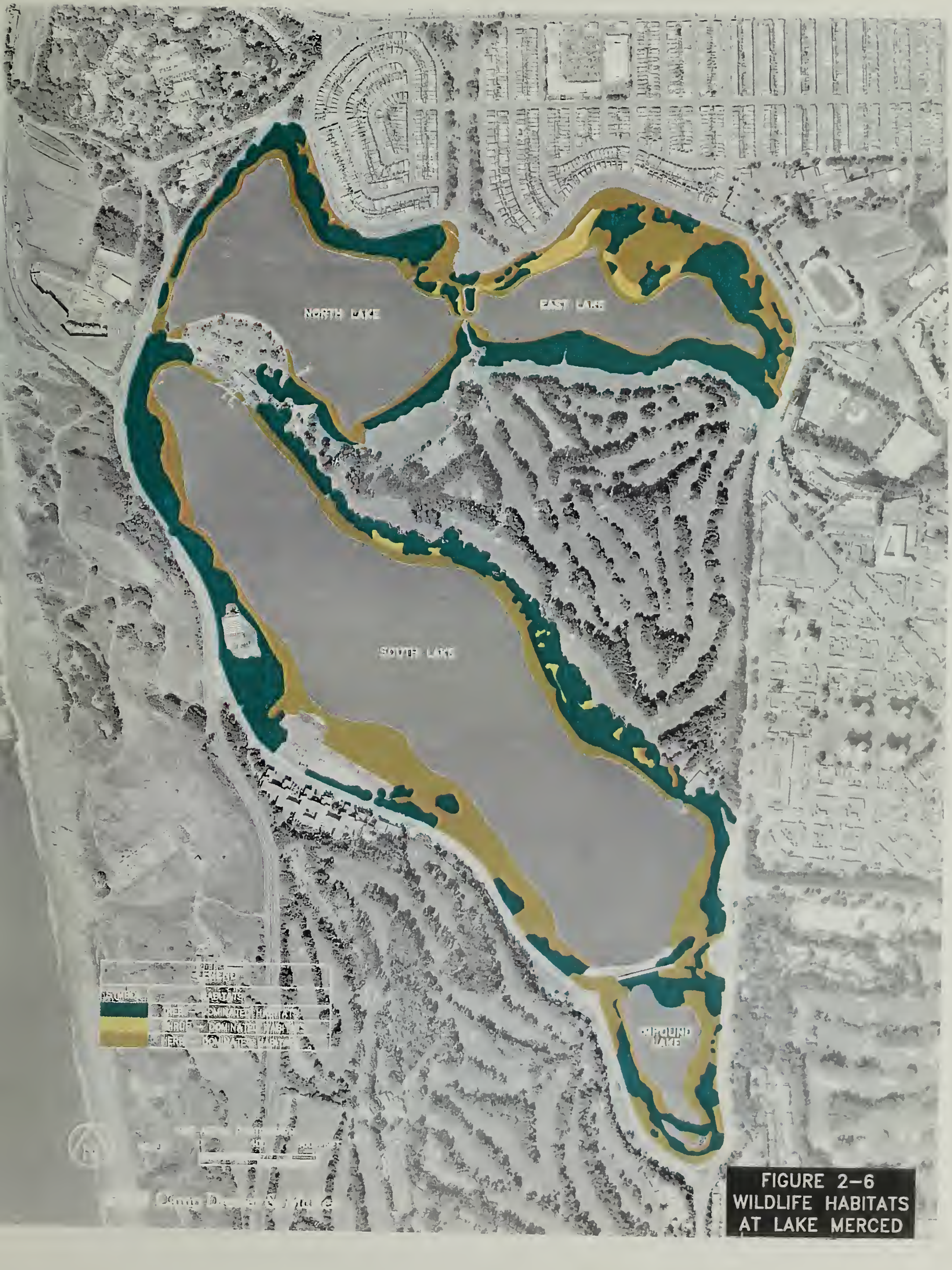


FIGURE 2–6
WILDLIFE HABITATS
AT LAKE MERCED

willow, coast live oak, eucalyptus, acacia, Monterey pine, and Monterey cypress. Only the willow and oak species are native to the Lake Merced area. Willows provide dense cover between the bulrush and upland habitats, and are inhabited by riparian bird species due to the proximity to water. The other five types of trees provide a coniferous and hardwood forest habitat to birds and other terrestrial animals (Trihey & Associates/CDM, 1998).

Shrub-dominated habitats consist of California blackberry and native coyote brush, the most common of the scrub species at the Lake. These plants are likely found along steep slopes surrounding the Lake and are home to 63 species of birds (Trihey & Associates/CDM, 1998).

Bulrush, water smartweed, rush, California annual grassland, and iceplant are found in herb-dominated habitats. The bulrush, rush, and water smartweed are associated with aquatic habitats consisting of wading and water birds, amphibians, reptiles, and some mammals (see Photographs 3 and 4). Annual grasslands and iceplant provide a grassland habitat farther away from the water (Trihey & Associates/CDM, 1998).

Lake Merced also provides habitat for special status wildlife. As many as nine special status species are known to occur or have the potential to occur in the area, including the California red-legged frog, a federal threatened species, and the saltmarsh yellowthroat, a federal species of concern. Table 2-1 presents scientific and status information on these special status species.

Table 2-1
Potential or Historic Special Status Species at Lake Merced

Species (common name)	***Species (scientific name)***	***Date Last Reported at Lake Merced***	***Lake Merced Status***	***Listing Status***
Plants				
Kellogg's Horkelia	*Horkelia cuneata ssp sericea*	1956	Presumed Present	Federal: Species of Concern State: None
San Francisco Bay Spineflower	*Chorizanthe cuspidata var cuspidata*	1953	Presumed Present	Federal: Species of Concern State: None
San Francisco Lessingia	*Lessingia germanorum*	1958	Possibly Extinct	Federal: Endangered State: Endangered
Animals				
American Peregrine Falcon	*Falco peregrinus anatum*	1996	Presumed Present	Federal: Endangered State: Endangered
Bank Swallow	*Riparia riparia (nesting)*	1985	Presumed Present	Federal: None State: Threatened
California Black Rail	*Laterallus jamaicensis coturniculus*	1937	Presumed Present	Federal: Species of Concern State: Threatened
California Red-Legged Frog	*Rana aurora draytonii*	1966	Presumed Present	Federal: Threatened State: None
Saltmarsh Common Yellowthroat	*Geothlypis trichas sinuosa*	1985	Presumed Present	Federal: Species of Concern State: None

Source: Trihey & Associates/CDM, 1998.

The San Francisco Recreation and Park Commission listed Lake Merced as a "Significant Natural Resource Area" in Resolution No. 9501-008 in 1995. These are areas which have maintained much of the natural environment that historically existed between the Golden Gate headlands and San Bruno Mountain. There are very few of these areas left in San Francisco. Natural resources areas

are important in providing opportunities to sustain an environment for uncommon or threatened wildlife and to educate the public on the natural environment.

2.2 Beneficial Uses of Lake Merced

The 1995 Basin Plan set forth six beneficial uses for Lake Merced. The Draft Lake Merced CMP grouped them into three categories: potential municipal water resource, regional recreation resource, and significant natural resource area (SFPUC/SFRPD, 1997). Each of these categories is discussed below.

2.2.1 Potential Municipal Water Resource

Lake Merced is listed in the Basin Plan as a potential source of municipal and domestic drinking water. The water quality issues related to this use are "protection of public health, aesthetic acceptability of the water, and the economic impacts associated with treatment or quality-related damages" (California Regional Water Quality Control Board, 1995). According to the Surface Water Treatment Rule (SWTR), surface water suppliers must provide "multibarrier treatment" to protect users from microbial contaminants in municipal water. This process must include filtration and disinfection of the water. Lake Merced does not have permanent filtration and disinfection capabilities. Consequently, Lake Merced has been classified as a potential water source for emergency use rather than everyday potable use.

2.2.2 Regional Recreational Resource

The Basin Plan lists Lake Merced as providing both contact and non-contact water recreation beneficial uses. The only "contact" recreation activities, as defined by the Basin Plan, allowed at the Lake are fishing and windsurfing. Due to the Lake's potential as a source of drinking water, the SFPUC has prohibited all other forms of recreational activities that include body contact with the water. Non-contact recreation is defined as uses that involve the presence of water but do not require contact with water, such as bicycling (see Photograph 5), bird watching, picnicking (see Photograph 6), pleasure boating, and aesthetic enjoyment (California Regional Water Quality Control Board, 1995). A significant portion of Lake Merced's recreational usage comes from visitors bicycling, jogging, walking around the Lake, enjoying the scenery, and observing the natural environment. There is a system of paths and trails that encircle the Lake for the use of bicyclists and joggers.

Fishing is a popular form of recreation at the Lake (see Photograph 7). The Lake Merced Boating and Fishing Company, located on Harding Park Road, rents non-motorized boats and sells bait and fishing permits to enthusiasts. The Lake is stocked with trout at both North and South Lakes by the Lake Merced Boating and Fishing Company and the Department of Fish and Game (DFG). DFG stocks approximately 48,000 fish per year in North Lake and 60,000 trout per year in South Lake. Rainbow trout account for 90 percent of all fish caught at the Lake. Non-stocked black bass, catfish, and carp are also fished.

Boating is another popular form of recreation at the Lake. North and South Lakes allow a mix of boating opportunities such as canoeing, sailing, sculling, row boats, and paddle boats. The Lake Merced Boating and Fishing Company has a fleet of 40 row boats and canoes for rent. Six docks along Harding Park Road on both North and South Lakes are used for fishing and boat docking

(Lake Merced Boating and Fishing Company, 1998). Two local high schools, two private clubs, and SFSU use South Lake for rowing and sculling activities. The boats are stored in bays underneath The Boathouse Restaurant.

HPMGC opened in 1925 and includes the 9-hole Jack Fleming Golf Course, the 18-hole Harding Golf Course, and a driving range (see Photograph 8). As the only public golf course among four courses within two miles of the Lake, HPMGC is heavily used. Guests play from six o'clock in the morning until sundown. Approximately 100,000 rounds of golf are played annually (SFRPD, 1998).

The Pacific Rod and Gun Club is located on the west shore of South Lake along John Muir Drive (see Photograph 9). The club offers skeet shooting on 13 acres of lake-front property. The club is open three days a week. New San Francisco police officers are occasionally trained in the use of firearms at the gun club, as well as at the SFPD Range just north of the club.

The SFPD Range property is owned by the SFPD and is not under the jurisdiction of SFPUC or SFRPD. The range is not open to the public.

2.2.3 Significant Natural Resource and Education Area

The Basin Plan lists three beneficial uses for Lake Merced regarding wildlife: warm fresh water habitat, cold fresh water habitat, and fish spawning. Warm fresh water habitats sustain fish such as bass and perch, frogs, crayfish, and insects. This type of environment is more diverse than cold fresh water habitats which support trout, and is less sensitive to changes in water conditions. The water quality requirements for fish spawning demand that the Lake provide "a high quality aquatic habitat especially suitable for fish spawning" and "free movement of water" (California Regional Water Quality Control Board, 1995). Lake Merced is freely accessible to school and non-profit groups, such as the Audubon Society and the California Native Plant Society, for use as a natural resource education area.

2.3 Lake Merced Hydrology and Water Supply

2.3.1 Hydrology

Lake volume, surface area, and depth vary with changing lake levels. As of September 1998, the total lake volume was 3,090 acre-feet (ac-ft). The volume of North, South, and Impound Lakes was approximately 860 ac-ft, 2,150 ac-ft, and 80 ac-ft, respectively. The surface area of North, South, and Impound Lakes was approximately 88 acres, 163 acres, and 15 acres, respectively (ENTRIX, 1988). The depth of Lake Merced varies between the lakes, but is relatively constant within each lake. The average depth of North, South, and Impound Lakes was approximately 9.8 feet, 13 feet, and 5.5 feet, respectively. The deepest holes in the lake bottom are found in South Lake at approximately 20 feet below the water surface (ENTRIX, 1988).

Lake Merced has a complex hydrology of inflow and outflow controlled largely by precipitation and the Lake's relationship to groundwater. The SFPUC has added imported potable surface water to the Lake from Lake Merced Pump Station to raise lake levels. Presented below is the current understanding of lake inflow and outflow based upon data obtained for 1990 through 1995. This information was derived from the CH2M HILL modeling study (CH2M HILL, 1997). This model was originally developed to project water quality and flows. The model results are presented to

give an understanding of how the Lake inflows compare to Lake volume. Lake inflow and outflow data prior to 1990 was not collected or reported consistently and was therefore not used as part of this assessment.

Inflow to Lake Merced

The main source of water for Lake Merced is precipitation, comprising approximately 65 percent of the average total inflow to the Lake during the period from 1990 to 1995. The rest of the inflow during this period came from three sources: recharge from the underlying groundwater aquifer, approximately 22% on average; addition of SFPUC potable water, approximately 11% on average; and local stormwater runoff, approximately 2% on average (CH2M HILL, 1997; SFPUC, 1997). Table 2-2 presents the components of inflow to Lake Merced from 1990 through 1995.

Table 2-2
Inflow to Lake Merced

Year	***Sources (acre-feet)***			
	Groundwater Recharge to Lake	***Direct Precipitation***	***Local Runoff***	***SFPUC Water Discharge***
1990	121	426	15	0
1991	122	272	9	0
1992	128	364	13	0
1993	130	417	15	0
1994	152	550	19	0
1995	124	307	11	905

Source: CH2M HILL, 1997.

Groundwater Recharge to Lake

Lake Merced has a complex pattern of groundwater flow, with both discharge to the subsurface and recharge by groundwater inflow. In general, North and East Lakes are recharged by groundwater where South and Impound Lakes experience seepage (CH2M HILL, 1998a). Groundwater currently supplies 20-30% of the average lake inflow for all the lakes combined. The general direction of groundwater flow in the area of Lake Merced is from east to west. Groundwater recharge to the Lake likely results from precipitation and irrigation recharging groundwater north and east of the Lake in the historic watershed (see Figure 2-2).

Precipitation

Precipitation falling directly on Lake Merced (direct precipitation) will cause an increase in Lake levels. San Francisco receives an average of 21.8 inches of rainfall per year. During the period of 1990 through 1995, the average amount of direct precipitation inflow to Lake Merced was 389 acre-feet per year (ac-ft/yr) (CH2M HILL, 1997). Local stormwater runoff enters Lake Merced from catch basins located on the north and west perimeter roads. These roads are maintained by the San Francisco Department of Public Works and the California Department of Transportation. Figure 2-7, Lake Merced Major Sanitary Sewer Pipelines, presents the sewer and stormwater lines associated with San Francisco and Daly City's stormwater/sewer systems in the area of Lake Merced. The average local runoff is small, at about 14 ac-ft/yr, from 1990 through 1995.

Storm Event Overflows

Occasional overflows from the Vista Grande Channel maintained by Daly City also discharge stormwater into the Lake. The channel is located between John Muir Drive and Olympic Country Club along the southwest side of the Lake as shown on Figure 2-7. Since these events are infrequent, no routine records are kept regarding their occurrence. The capacity of the Vista Grande Channel and tunnel is inadequate to contain stormwater from a four-hour rainfall event with a five-year return period. During the period of 1973 to 1985, it is estimated that overflow volume may have ranged from very slight to 60 million gallons per event-month (SFPUC, 1998c). The channel

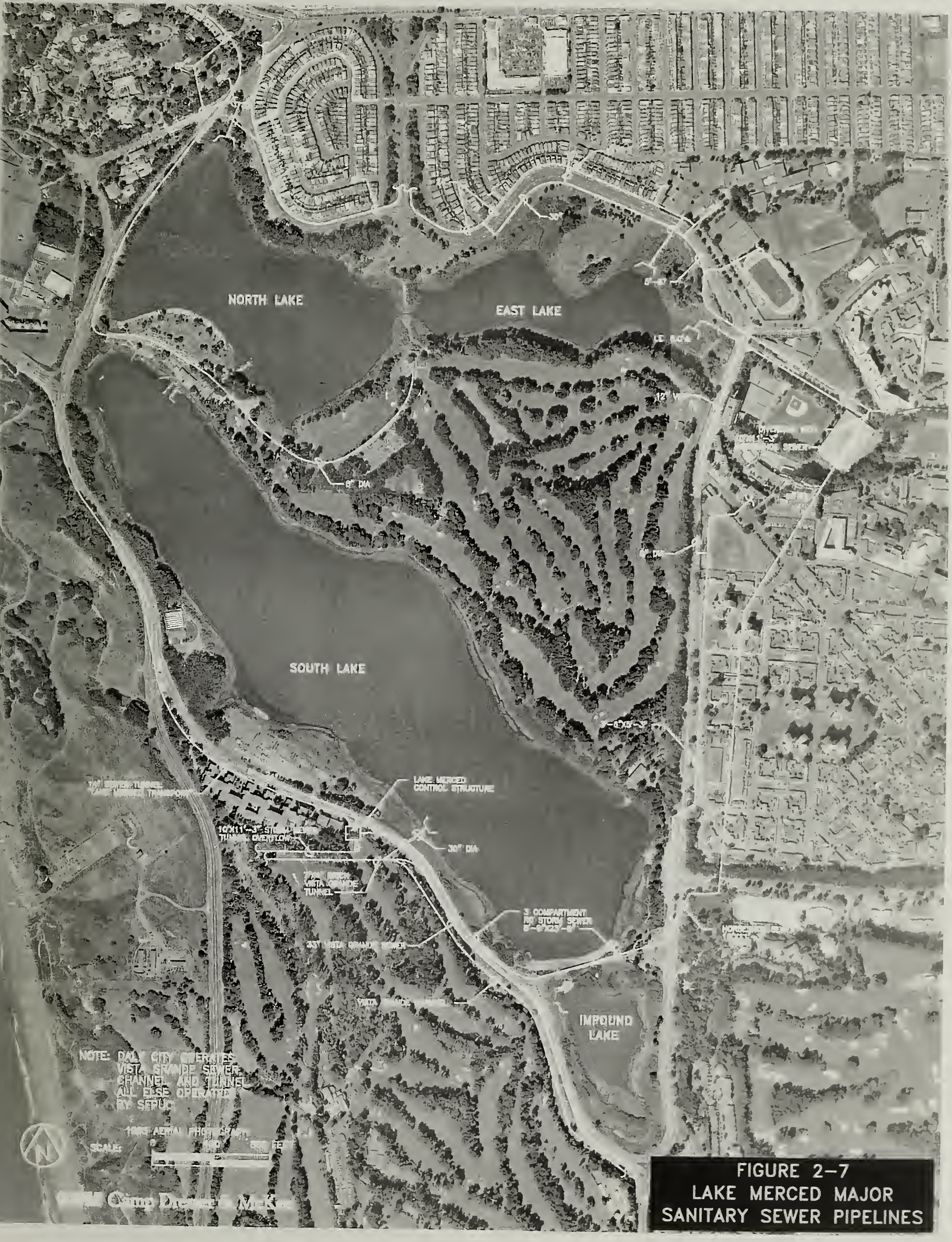


FIGURE 2–7
LAKE MERCED MAJOR
SANITARY SEWER PIPELINES

has overflowed onto the Olympic Country Club at the fairways for holes 11 and 14 of the Ocean Golf Course, and holes 6, 9, 11, 14, and 18 of the Lake Golf Course (Olympic Country Club, 1998). The channel also overflows across John Muir Drive into Lake Merced when the capacity is exceeded. See Section 3.2.3 for more information on the most recent overflow event. No flow estimating has been performed for water entering the Lake from Vista Grande Channel during overflow events.

SFPUC Water Discharge

SFPUC imported potable surface water can be added to the Lake at LMPS. A 12-inch pipe at the Pump No. 2 discharge conveys water to the wetwell intake tower at LMPS. This water flows through the intake screens and into the Lake. The primary reason for supplementing the Lake has been to increase lake levels. Decreased lake levels diminish the water available for the City in an emergency.

SFPUC restricts the amount and time of the year that water can be discharged due to concerns for wildlife habitat and bird nesting. The SFPUC filed a categorical exemption for California Environmental Quality Act (CEQA) compliance for the adding of water to Lake Merced in 1997. The exemption states that water can be added to the lake as follows: "(1) prior to February 15 and after July 15, the lake's water level will not increase more than one foot above the elevation as of July 15; (2) from February 15 to April 15, the lake's water level will not increase more than six inches above the water elevation existing as of February 15; and (3) from April 15 to July 15 no water will be pumped into the lake unless approved by DFG and the Golden Gate Audubon Society." (SFPUC, 1999a).

In 1997, the SFPUC proposed to add available water to Lake Merced for a period of five years through 2001. In 1997, the SFPUC discharged 128 ac-ft to the Lake (SFPUC, 1997).

Outflow from Lake Merced

Lake Merced has had no surface outlet from the time the Lake's access to the ocean was permanently closed in 1895. Outflows from the Lake occur through evaporation, seepage to groundwater, and water pumping. As shown in Table 2-3, the largest component of outflow from the Lake is evaporation. The losses from evaporation account for approximately 93% of all outflow with an average evaporation loss of approximately 577 ac-ft/yr from 1990 to 1995 (CH2M HILL, 1997). Groundwater seepage from the Lake accounted for 7% of outflow. There are few official records on pumpage from the Lake. USGS estimated that HPMGC used approximately 153 ac-ft/yr for irrigation of the golf courses until 1990. It is believed that no water has been pumped from the Lake since 1990 (SFPUC, 1999b).

Table 2-3
Outflow from Lake Merced

Year	*Sources (acre-feet)*		
	Seepage from Lake	*Evaporation*	*Pumpage Out*
1990	55	586	150
1991	48	577	0
1992	39	570	0
1993	37	568	0
1994	26	571	0
1995	54	588	0

Source: CH2M HILL, 1997.

Lake Level Elevational Changes and Monitoring

Over the years, several different datums have been used for reporting the elevation or level of Lake Merced. Elevation has been reported corresponding to mean sea level datum (National Geodetic

water elevation is currently recorded at a standpipe connected to Lake Merced at LMPS. The depth of water in the standpipe is measured using an ultrasonic transducer. A digital readout is located inside the facility and pump station personnel monitor the levels. In this report, all lake measurements are given as elevations relative to San Francisco datum. To convert elevations to mean sea level, add 10.25 feet to the San Francisco datum.

Lake elevation has dropped since the mid-1900s. The highest elevation in the past 86 years was approximately 12.25 feet, occurring in 1912. The lowest elevation in this time frame occurred on November 27, 1993, at approximately -5.1 feet (Geo/Resource Consultants, Inc., 1993; SFPUC, 1998a). As of September 23, 1998, lake elevation is 0.76 feet (SFPUC, 1998a).

Figure 2-8 presents the trend in water elevation at Lake Merced from November 1987 to September 1998 as measured on the first day of each month. The lowest water elevation for this period was -4.9 feet, occurring on December 1, 1993. Since that time, water levels have been rising.

2.3.2 Facilities

Several important facilities exist in the Lake Merced watershed that are part of municipal water, stormwater, and sewer systems. These facilities are discussed below.

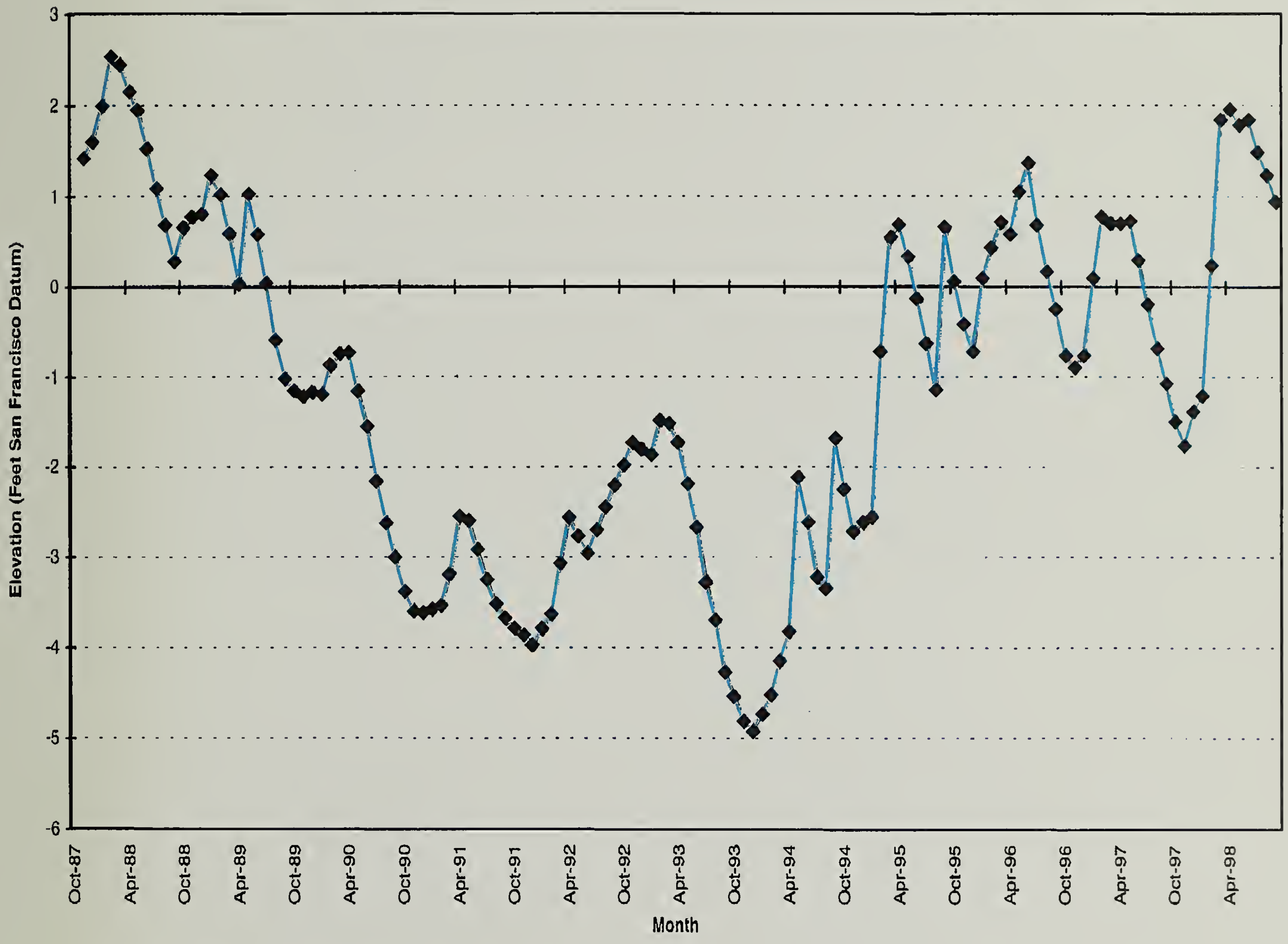
Municipal Water

Lake Merced Pump Station

The Lake Merced Pump Station is part of the SFPUC water distribution system. It is located at the southern end of HPMGC along Lake Merced Boulevard as shown on Figure 2-5. LMPS was built in 1953 and is under the jurisdiction of the SFPUC. The primary function of LMPS is to boost water pressure in the Sunset Supply Line, which carries water to Sunset and Sutro Reservoirs. The pump station receives potable surface water from the SFPUC water system. The SFPUC water system can transport surface water supplies from the Hetch Hetchy, Alameda, or Peninsula watersheds for delivery to LMPS. All surface water entering LMPS has been treated at upstream locations (dependent upon the origin of the surface water supply) to meet SWTR requirements.

The pump station houses eight pumps to cover 24 hours-a-day operation combined (see Photograph 10). The maximum treated water pumping capacity is 51 million gallons per day (mgd). Pumps No. 1 through 6 have individual capacities ranging from 11,500 gallons per minute (gpm) to 17,250 gpm. Pumps No. 7 and 8 each have a capacity of 17,500 gpm. Typically, pumps No. 1 through 3 are used to supply water to Sunset Reservoir, and No. 4 through 6 are used for Sutro Reservoir (Geo/Resource Consultants, Inc., 1993).

Another function of LMPS is to deliver lake water into the supply system during an emergency. Pumps No. 7 and 8 are specifically designated for emergency use and would pump lake water from three 72-inch screened drums in the Lake. In addition, pumps No. 5 and 6 can be reconfigured for emergency use. Water can be delivered to Sunset Reservoir at 33.3 mgd and to Sutro Reservoir at 16.7 mgd (Geo/Resource Consultants, Inc., 1993). If there is a loss of electricity, LMPS has two diesel generators with two 12,000-gallon diesel fuel underground storage tanks (USTs) that can power the four pumps for three to five days (Lake Merced Pump Station, 1998a). These USTs are double-walled and comply with current UST regulations.



Source: San Francisco Public Utilities Commission, 1998a.

Note: Water levels shown are recorded on the first day of each month.

CDM Camp Dresser & McKee Inc.

Figure 2-8
Lake Merced Water Elevation, 1987 - 1998

LMPS has also been used to add water to the Lake from the SFPUC distribution system. The chlorinated water arriving at the pump station requires dechlorination before it is discharged to the Lake. There is a portable dechlorination facility at LMPS that uses sodium bisulfate for its dechlorination operations. The dechlorinated water enters the Lake through the wetwell intake tower at LMPS (Lake Merced Pump Station, 1998b). Table 2-2, Inflow to Lake Merced, shows the recorded amounts of water added to the Lake during 1990 to 1995.

Sunset Supply Line

The Sunset Supply Line conveys water for the SFPUC distribution system. It receives pressurized water from LMPS and carries the water to the Sunset Reservoir. The underground five-foot diameter pipe parallels Lake Merced Boulevard. A portion of the line is aboveground as it crosses the eastern edge of North Lake (see Photograph 11). In the past, this section of the pipeline has been submerged in the Lake, but due to changes in lake elevation it is now exposed (SFPUC, 1998b).

Harding Park Irrigation

Up until the late 1980's, water used for irrigation at HPMGC was supplied from South Lake via a small pump house at the corner of Harding Park Road and Skyline Boulevard and from a groundwater well located on the Harding Park golf course. As a result of the low lake water levels in the late 1980's, the two irrigation sources became unable to provide adequate water for the courses. The groundwater well had been taken off-line around 1980. A new source for the irrigation supply was provided from a tap on the treated water Sunset Supply Line (see Photograph 12). HPMGC is currently supplied irrigation water from a nine-inch diameter fiberglass pipeline tapping into the Sunset Supply Line (SFRPD, 1999a). The tap location is near the intersection of Font Boulevard and Lake Merced Boulevard. The valving and backflow preventers for the irrigation system tap are located aboveground in a chain-link fenced area just south of the 12th tee on the golf course. There is no meter on the irrigation supply and no engineering drawings exist.

Stormwater

Vista Grande Channel

The Vista Grande Channel and tunnel were constructed in 1897 by the Spring Valley Water Company (SWVC) to convey stormwater around Lake Merced. The channel parallels John Muir Drive along the southwest shore of Lake Merced as shown on Figure 2-7 and Photograph 13. The channel conveys stormwater flow from a system of 37 miles of gravity conduits draining about 2.25 square miles of Daly City. From the discharge of the Daly City conduits, the open brick-lined channel conveys stormwater to the tunnel entrance. The tunnel is the main discharge outlet for stormwater from Daly City. The channel enters the tunnel at a point south of the Pacific Rod and Gun Club (see Figure 2-7). The 3,030-foot long tunnel has a nonsurcharged capacity estimated at 170 cubic feet per second (cfs) and connects to an outlet structure below Fort Funston. The outlet structure consists of a 2,500-foot outfall and diffuser which carries the flow out to the Pacific Ocean, and two flap gates that discharge directly to the beach during high flow or high tide conditions.

The channel and the tunnel are owned by San Francisco, and Daly City holds a permit to operate the system. Daly City and the North San Mateo County Sanitation District (NSMCSD) share the use of the Vista Grande tunnel and have an arrangement for use during dry and wet weather. During dry weather, both Daly City's stormwater and NSMCSD's secondary wastewater treatment plant

effluent are discharged into the tunnel. The 33-inch treatment plant effluent pipeline connection to the tunnel is shown on Figure 2-7. This dry weather flow is discharged to the ocean through the outfall and diffuser. In periods of wet weather, the plant effluent flows are diverted to a NSMCSD force main rather than the tunnel. Daly City is allowed full use of the Vista Grande tunnel for its stormwater. The NSMCSD force main connects to the downstream end of Vista Grande tunnel, allowing the treatment plant effluent to be discharged through the outfall and diffuser. Stormwater from Daly City is discharged either through the outfall or through the flap gates (Kennedy/Jenks Engineers, 1983).

During an inspection of the Vista Grande Channel in 1983, a 30-inch diameter pipe leading to Lake Merced was observed to connect within the first 20 feet of the tunnel as shown on Figure 2-7 (Kennedy/Jenks Engineers, 1983). This pipeline is likely the overflow pipeline described in the USGS study of the Lake (USGS, 1990). The pipe is believed to act as an overflow structure for Lake Merced, controlled by valving in the gate house at the mouth of the tunnel. However, the municipal agency responsible for operation of the line is not known. It is believed that the valving on the pipeline is closed and is no longer operable since it has not been used in many years.

When stormwater flows in the channel exceed the capacity of the tunnel, the channel overflows onto John Muir Drive and into Lake Merced. See Section 3.2.3 for a description of the overflows.

Sewer

Viaduct

The viaduct that separates South Lake from Impound Lake was built in 1950 and is located south of the intersection of Lake Merced Boulevard and Brotherhood Way, as shown on Figure 2-5. This structure allows water to flow between the two lakes during periods of high water elevation, provides a walkway from the Lake Merced Boulevard and John Muir Drive parking lots and rest areas, and houses three sewer lines (see Photograph 14). These sewer lines carry sanitary wastewater and stormwater from southern San Francisco to the Lake Merced Control Structure (LMCS), as shown on Figure 2-7 just east of the Oakwood Apartments on John Muir Drive (see Photograph 15). LMCS conveys wastewater to the Lake Merced Transport and OWPCP (SFPUC, 1998b).

Lake Merced Transport

The Lake Merced Transport is a 14-foot diameter tunnel from the LMCS to the Westside Pump Station located at the corner of Sloat Boulevard and the Great Highway. It carries sewer flows from the LMCS along the perimeter of the Lake northwest along John Muir Drive, Skyline Boulevard, and the Great Highway before reaching the Westside Pump Station. The location of the transport is shown on Figure 2-7.

3

Section Three

Section 3
Lake Merced Potential Contaminant Sources

3.1 Survey Methods

CDM conducted a field survey of Lake Merced and the surrounding areas on July 15, 16, and 22, September 2, and October 14, 1998. This survey was used to visually determine the existence of contamination or potential for contamination that may adversely impact the water quality of Lake Merced. CDM produced notes and photographs used to develop field maps detailing potential locations of contaminant sources.

CDM also conducted interviews with people knowledgeable of the operations in and around Lake Merced including the Pacific Rod and Gun Club, the Olympic Country Club, Harding Park Municipal Golf Courses, the San Francisco Zoo, and local residents (see Appendix C, Contacts). CDM reviewed aerial photographs and documents previously developed on Lake Merced water quality and quantity, surrounding land use, and engineering controls. The information collected during this task was used to identify the potential contaminant sources detailed in this section.

3.2 Potential Contaminant Sources

Lake Merced has four primary sources of recharge: direct rainfall, groundwater, SFPUC imported potable surface water, and stormwater runoff from the surrounding watershed. The last three are assumed to have the potential to contaminate the Lake.

Groundwater constitutes approximately 20 to 30 percent of the water entering Lake Merced; therefore, the water quality of the Lake is influenced by the water quality of the supplying groundwater aquifer through both differences in water chemistry and the potential transportation of contaminants. Activities outside of the immediate watershed can affect groundwater quality and in turn affect the Lake through seepage.

Potential contaminants to groundwater include leaking underground storage tanks (LUSTs), leaking sewer pipes, and hazardous materials, nutrients, pesticides, and herbicides in the aquifer.

SFPUC imported potable surface water meets all current drinking water regulations, and therefore is high in purity. However, chlorine and in the future chloramine are potentially toxic to aquatic life and must therefore be removed prior to the water being discharged to the Lake.

Stormwater runoff from the surrounding watershed can include any contaminants which are present in the watershed or contaminants from activities which occur in the watershed. These potential contaminants include hazardous materials, stormwater and sewer overflows, fecal matter deposited on land from wildlife and recreation activity, metals, oil and grease, litter and debris, sediments, nutrients, herbicides and pesticides.

Potential pollutants from each source are described in the following sections.

3.2.1 Hazardous Materials and Waste

The potential hazardous materials and waste contaminant sources include LUSTs and releases of hazardous materials. As part of the data search, CDM contacted Environmental Data Resources, Inc. (EDR) to obtain information on these contaminant sources. EDR maintains a database of all hazardous materials and waste storage sites and release sites throughout California reported to environmental regulatory agencies. The EDR database is included as Appendix D. Table 3-1 presents the contaminated sites listed in the EDR database that are within one mile of Lake Merced and are upgradient of groundwater flow (groundwater flows from east to west) or adjacent to the Lake. The sites are shown on Figure 2-5. Excluded from Table 3-1 are non-leaking USTs, LUST sites closed by the regulatory agencies, and two sites with asbestos waste. Asbestos has little or no potential for migration in groundwater.

Table 3-1
Contaminated Sites with the Potential to Effect Lake Merced

Site and Address	*Contaminant*	*Proximity to Lake Merced*	*Year Identified*
Harding Park Golf Course Clubhouse 99 Harding Park Road	LUST – gasoline	< ¼ mile	1986
SFPD Range Skyline Boulevard and John Muir Drive	Lead-contaminated soil	¼-½ mile	1990
Pacific Rod and Gun Club (1) 520 John Muir Drive	Lead-contaminated soil and aquatic sediments	¼-½ mile	1990

(1) Information obtained from the Regional Water Quality Control Board; site was not listed in the EDR database.

Source: EDR, 1998; Applied Technology & Science, 1999.

A release of gasoline occurred from a UST located at HPMGC. This release was reported following removal of the UST in 1986. According to the San Francisco Department of Public Health (SFDPH), it is unknown whether soil or groundwater has been effected or if any remediation has occurred. A UST closure report has not been submitted to the SFDPH (SFDPH, 1999).

Lead-contaminated soil is present at the SFPD Range, most likely due to the use of lead shot in their firearm operations. The highest concentration of lead found in the soil was 6,000 parts per million (ppm). Three groundwater monitoring wells were installed; no lead was detected in groundwater samples. The SFPD Range is planning extensive renovation and is required by the California Department of Toxic Substances Control (DTSC) to prepare a medium priority Preliminary Endangerment Assessment (PEA) to evaluate the environmental and health effects of lead in the soil (Applied Technology & Science, 1999).

Terrestrial soil at the Pacific Rod and Gun Club is contaminated with lead at concentrations which in some cases exceed 1,000 ppm, which is greater than the California hazardous waste threshold for lead. Portions of the aquatic sediments are also contaminated with lead at concentrations ranging from 143 ppm to 14,000 ppm. The Regional Water Quality Control Board issued a Site Cleanup Order to the club in 1994. The order instructed the club to discontinue the use of lead in their shooting operations, develop a remedial action plan, and implement the plan. The club replaced their lead pellets with steel and bismuth pellets in 1994. It is CDM's understanding that the remaining two items have not been addressed (Applied Technology & Science, 1999).

DFG has made several attempts to collect lead shot from the Lake, however the collection methods have not been successful. A study performed to determine the effect of the lead shot to the water quality at the Lake concluded that the lead pellets did not significantly affect the Lake water quality (Crosby and Overton, 1990). There is no information regarding whether any of the lead shot was removed from the terrestrial soils. It is estimated that over 100 tons of lead shot remain in Lake Merced and 9,000 cubic yards of terrestrial soil are contaminated (Applied Technology & Science, 1999).

3.2.2 Chlorinated Water Discharge

The Sunset Supply Line is a 60-inch diameter line which receives pressurized flows from LMPS and supplies the Sunset and Sutro Reservoirs as part of the SFPUC distribution system. The alignment of the pipeline parallels the east side of Lake Merced. Other water distribution pipelines surrounding the Lake include a 16-inch diameter pipe along John Muir Drive to about Skyline Boulevard and a 10-inch diameter pipe along Harding Park Road.

The introduction of large quantities of chlorinated water can have a detrimental effect on plant and wildlife associated with Lake Merced. Discharges of chlorinated water are never intentional, but can result from unplanned discharges, seismic failure of a pipeline, lake filling operations with improper dechlorination procedures, or during emergency repairs on the pipeline. There are no records of recent chlorinated discharges to the Lake.

Chlorinated water could also enter the Lake during lake filling operations or during maintenance on the pipelines. As described in Section 2.3.2, LMPS is also used as a source to maintain or increase the water level of the Lake. The SFPUC maintains a dechlorination facility at LMPS that is operated and staffed whenever water is discharged to the Lake. The chlorinated potable water is dechlorinated with sodium bisulfate and discharged into the Lake. These discharge events are typically closely monitored to ensure the chlorine residual is removed before discharge. For maintenance in the vicinity of Lake Merced, the SFPUC distribution system contains three blow-off valves, including two eight-inch valves discharging into East Lake and a four-inch valve with potential to drain into Impound Lake. The blowoff valves are located at low points in the pipeline and are used to drain the pipeline for maintenance and repairs. Blowoff water is routinely dechlorinated before it is discharged to the Lake.

In the future, the SFPUC will be changing the disinfectant in the potable water distribution system from chlorine to chloramine. Chloramine contains both chlorine and ammonia. The chlorine portion is readily removed using the same chemical processes currently used at the Lake. The ammonia will provide a small nitrogen source to the Lake. The SFPUC is planning to study the effects of this ammonia addition at Lake Merced and at other SFPUC reservoirs. The chloramine conversion is planned to be implemented in 2002.

3.2.3 Vista Grande Channel Overflow

Vista Grande Channel can overflow and introduce stormwater from the Daly City area into the Lake. Overflows from the channel have been known to occur during periods of intense rainfall which cause the carrying capacity of the channel to be exceeded. The last known occurrence was

January 1998. Vista Grande Channel typically overflows into Lake Merced along John Muir Drive between the LMCS and Impound Lake.

Hydrologic studies of the capacity of the Vista Grande Channel estimate that the channel's design capacity is exceeded for a 5-year 4-hour storm, resulting in approximately 25 million gallons of water overflowing into Lake Merced from this type of storm event (Kennedy-Jenks, 1983). The capacity of the Vista Grande Tunnel is 170 cfs, so storm flows that exceed this capacity plus the capacity of the channel will overflow into Lake Merced. The frequency of overflow occurrence is unknown, but it is a problem when it does occur, sometimes causing John Muir Drive to be closed. Using the drainage area and hydrologic data for San Francisco, and some very basic conservative assumptions, SFPUC staff generated a hydrograph that shows estimated historical system flows from 1973 to 1985. During this period, the channel was likely to carry stormwater an average of about 6 months in each year, and the overflow volume may have ranged from very slight to as much as about 60 million gallons of overflow per event-month (SFPUC, 1998c).

On January 18, 1998, a severe storm caused two trees to fall into the Vista Grande Channel, impeding flow to the Vista Grande Tunnel. The blocked channel overflowed, and part of John Muir Drive collapsed. Two inches of rain fell on January 18, resulting in a 6-inch Lake level rise. This back-calculates into an approximate additional 20 MG of water that entered Lake Merced besides rainfall, which was most likely from the Vista Grande Channel overflow.

The risk of contamination from uncontrolled stormwater overflows is reduced due to the stormwater pollution prevention program currently practiced by Daly City. The City of Daly City is one of the participating agencies in the San Mateo Countywide Stormwater Pollution Prevention Program. This program has developed a stormwater management plan describing stormwater prevention and control goals, tools, and completion schedules. The plan identifies what member agencies are committed to do to control stormwater pollutants. These activities include maintenance (street sweeping, stormdrain cleaning, etc.), illicit discharge controls, public information about stormwater pollution, construction and other development stormwater discharge quality controls, and evaluation of control practices.

Although the risk of contamination is reduced by Daly City's participation in the stormwater management plan, there is little available information regarding the Vista Grande Channel stormwater quality prior to 1998. Recent stormwater quality monitoring performed by the SFPUC is summarized in Section 4.

3.2.4 Combined Sewer Overflows and Sewer Exfiltration

Lake Merced is surrounded by sanitary and storm sewer pipelines ranging in size from small diameter services serving neighborhoods to the 14-foot diameter Lake Merced Transport. The major sewer pipelines around the Lake are shown in Figure 2-7. The sanitary sewer collects sewage flow from residential, recreational, and commercial areas in and around the Lake, including the public restrooms at HPMGC, The Boathouse Restaurant, and the Pacific Rod and Gun Club. The sewer system is a combined system which also collects stormwater from around the Lake. The potential source of contamination from the sewer system is combined sewer overflows during wet weather events.

The two types of combined sewer overflows which may occur are the discharges from hard-piped overflows and the overflow of the collection system. In the first case, discharge piping from the collection system was constructed to allow an overflow of the collection system into the Lake before high sewer flows cause street or residential flooding. These represent a potential point contamination source. From the information on existing sewer maps, there are three areas where this type of discharge piping was constructed to allow discharges into North and East Lakes. These locations are shown on Figure 2-7. One is a twelve-inch corrugated metal pipe located near the intersection of Skyline Boulevard and Lake Merced Boulevard. Another is west of the intersection of Lake Merced Boulevard and Middlefield Drive. The third is located at the end of State Drive on the SFSU campus, with the overflow pipeline paralleling State Drive. This third overflow includes a diversion weir to provide separation of solid debris. Based on discussions with City staff, it is believed that these overflows have been blocked or removed from the collection system (SFPUC, 1998d). However, no records or maps showing the removal of the overflows are available. Field inspection of manhole and sewer lines will be necessary to determine if the overflows have been taken out of service.

The second type of overflow will occur when flows exceed the sewer capacity, causing water to flow out of the top of the manholes. If this overflow occurs within the watershed, the overflow water will eventually run into the Lake. Since the Lake is surrounded and crossed by sanitary sewers, it is possible for this type of overflow to reach the Lake. The frequency of this type of overflow is unknown, but will depend on the design capacity of the sewer.

Perhaps more threatening than an indirect discharge would be the destruction of one of the large capacity sewer mains surrounding Lake Merced. During the wet weather events in early 1998, an overflow of the Vista Grande Channel into the Lake coincided with a washout of John Muir Drive. The washout came within a few feet of the three compartment sewer at the end of the viaduct. Had this sewer become separated at this location, the sanitary sewage and stormwater within the viaduct would have been washed into the Lake.

The groundwater near Lake Merced can also carry exfiltration from combined sewers into the Lake. Exfiltration occurs when wastewater escapes from the collection system through broken and leaking sewer lines. Nearly all gravity sewers, but in particular the older sewer pipelines, create exfiltration to some extent. The exfiltration conditions often go unrecognized and present a potential contaminant source associated with the daily use of the collection system. The municipal wastewater exfiltrating from the sewers contains high concentrations of nutrients and organic carbon. Nitrogen in wastewater is converted to nitrate, which is highly soluble and readily transmitted through the soil to groundwater. Nitrate is detected in the upgradient groundwater monitoring well at SFSU (see Section 4.2.2). Exfiltration can also carry coliform bacteria and pathogens that may be transported to the aquifer.

3.2.5 Stormwater from the Lake Merced Watershed

As noted in Section 3.2.4, the existing sewer system around Lake Merced is a combined system which collects both sanitary sewage and stormwater runoff. Stormwater runoff may be diverted to the combined sewer rather than the Lake at some locations. However, the City sewer maps surrounding Lake Merced do not show storm drain inlets or connections to the combined sewer. The locations of the storm drain inlets which were identified during the field surveys are shown on Figure 3-1. In some locations, such as along Skyline Boulevard at North Lake where unburied

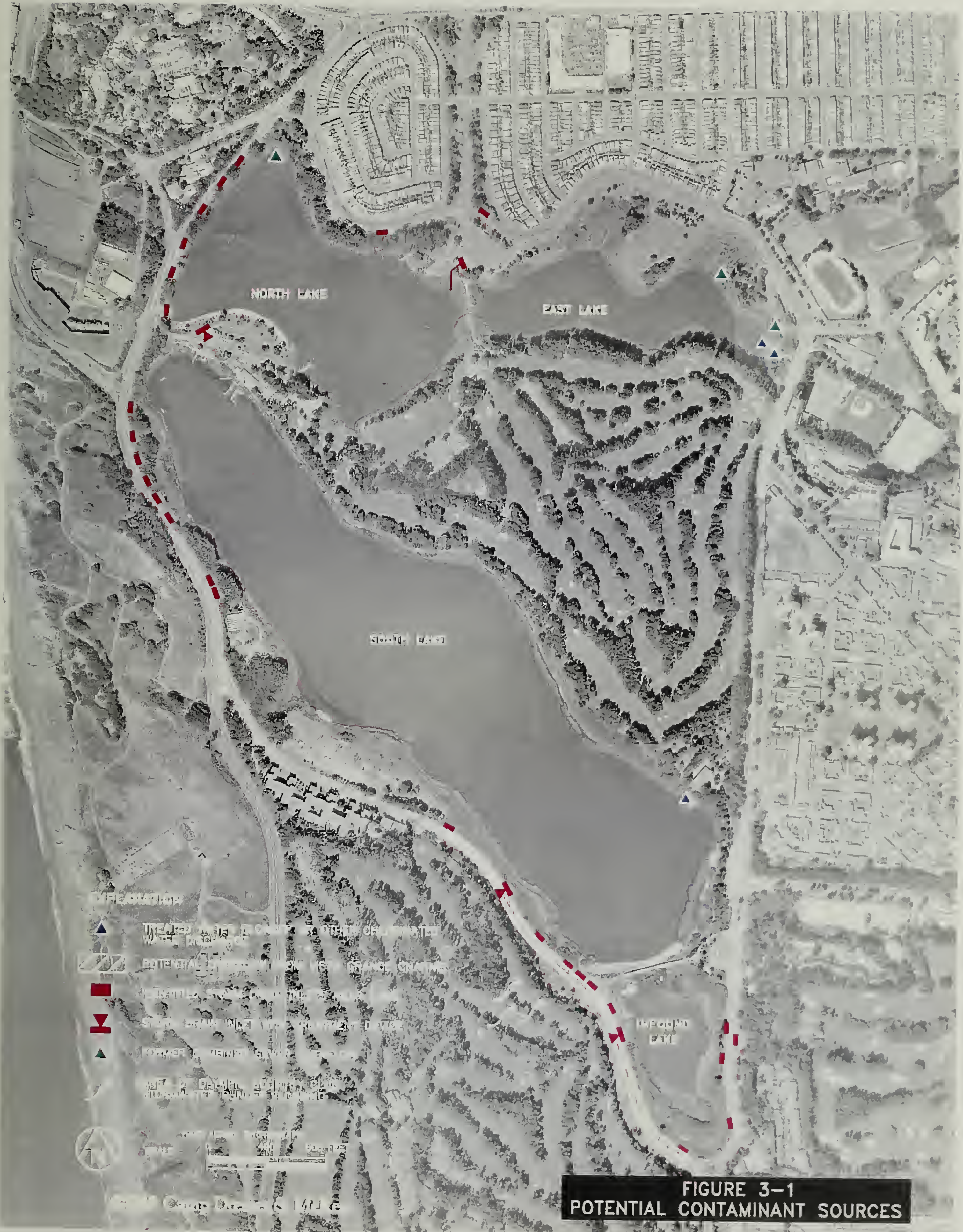


FIGURE 3–1
POTENTIAL CONTAMINANT SOURCES

corrugated metal storm drain piping into the Lake are clearly visible, the stormwater runoff discharge point can be verified. Along John Muir Drive, stormwater treatment units were recently installed to treat stormwater runoff from drain inlets which formerly discharged directly into the Lake. In other locations, the discharge location of the runoff collected in the drain inlets is not known. The stormwater discharge location for the remaining area surrounding the Lake, including Harding Park Road and the Sunset Boulevard and Brotherhood Way parking lots, could not be verified with the maps that were available, but is assumed to be the Lake. A comprehensive study of the drain inlets and piping is necessary to verify which areas discharge directly to the Lake.

Stormwater flows and contaminant concentrations can be highly variable. Some factors affecting this variability include duration and intensity of rainfall events, specific land use (residential, commercial, industrial, recreational, wildlife habitat), and the length of the preceding dry period during which pollutants build up on the land surface.

The stormwater contaminants of concern for water quality include microbial organisms and suspended sediments. Due to the large population of birds and feral cats, and the vegetative growth at and around the Lake which provides a home for rodents, microbial organisms are a likely contributor of contaminants via stormwater. High suspended sediment levels may result because of the ease of mobilization and transport of particles on impervious surfaces. Other contaminants of concern include metals (copper, lead, and zinc), hydrocarbons (oils and greases) from the roadways surrounding the Lake, large debris, and pesticides and herbicides from the golf courses.

The SFPUC approved a plan for a stormwater demonstration project at Lake Merced. The treatment units were constructed in 1998 and tested in the winter of 1998-99. This project is anticipated to reduce the contaminants in the stormwater runoff. The project is described in greater detail in Section 4.

3.2.6 Pesticides and Fertilizers

Pesticides and herbicides are chemical compounds specifically formulated to diminish or eliminate the population of unwanted, uncontrolled, or often damaging insects or plant growth. These chemicals are used generally in agriculture, land adjacent to roadsides, landscaped areas such as parks and golf courses, and for structural pest control. Pesticide and herbicide use in and around Lake Merced is minimal with the exception of the golf courses.

CDM interviewed Mr. Bob Killian, SFRPD Golf Course Director, and Mr. John Fleming, Head of Grounds Maintenance for the Olympic Country Club, concerning the use of pesticides and herbicides on their respective golf courses. Mr. Killian is responsible for the buildings and grounds maintenance for the Harding Park and Jack Fleming Golf Courses, which are located within the watershed. The Olympic Country Club is not within the Lake Merced watershed, but some areas discharge stormwater into the Vista Grande Channel, as shown on Figure 3-1.

At the HPMGC, an eleven-person crew is responsible for the grounds maintenance. Application of pesticides, herbicides, and fungicides is performed by licensed applicators. Pesticides are stored in a metal storage locker that sits on a concrete pad at the grounds maintenance building. Approximately 10 years ago, fungicides were used preventatively throughout both courses; however, application quantity decreased due to expenses and also the regulations provided in the San Francisco Integrated Pesticide Management Ordinance. Currently, very limited quantities of

fungicides are applied on either course. Instead, organic methods of pest and weed control are being practiced. Table 3-2 presents a summary of the pesticides and fertilizers used at the courses in the last year and their frequency of application for HPMGC.

Both the Harding Park and Jack Fleming golf course areas are treated with herbicides and fungicides over the same types of areas. Herbicides are applied annually, with an additional application if necessary, to control the growth of broad-leaf weeds, such as daisies. Fungicides are applied only on the greens and tee boxes, while herbicides are applied on the fairways. The rough, areas where the grass is allowed to grow with only minimal maintenance, does not receive any treatments. Approximately 9,200 pounds of fertilizers are used annually at the golf courses. Fertilizers can impact Lake Merced through seepage to groundwater and surface runoff.

Table 3-2
Pesticide and Fertilizer Application Annual Use at Harding Park Municipal Golf Courses

Pesticides		
Trade Name	*Type of Pesticide*	*Annual Estimated Use*
Heritage	Fungicide	4 pounds
Scotts Systemic	Fungicide	12 pounds
Subdue 2E	Fungicide	Emergency Use Only
Banvel	Herbicide	7 gallons
Round-up Pro	Herbicide	2 gallons
Turflon Ester (1)	Herbicide	1 gallon
Eatons Answer (1)	4 oz. Gopher Blocks	37 pounds
Fertilizers		
Trade Name	*Nitrogen-Phosphate-Potash Content*	*Annual Estimated Use*
Calcium Nitrate	15-0-0	1100 pounds
Mini Pellet (BEST)	16-4-8	1400 pounds
Par Ex	21-0-0	5000 pounds
Ammonium Sulfate	21-0-0	700 pounds
High Potassium	15-0-30	1000 pounds

(1) Restricted use
Source: SFRPD, 1999a and 1999b.

According to Mr. Killian, the amount of water used for the golf course irrigation is unknown. Standard industry estimates are 500,000 gallons of water per day for an 18-hole course Mr. Killian also noted that this irrigation amount would be an overestimate of HPMGC use due to its proximity

to the ocean. The application rates of water are set at an appropriate rate to minimize or eliminate runoff; however, contaminants can be transported to groundwater via percolation. Mr. Killian believes that any runoff from the courses into Lake Merced that may occur would be minute (SFRPD, 1999a). CDM did not observe any irrigation or runoff from the golf courses to the Lake during the site visits.

According to Mr. Fleming, pesticide and herbicide application at the Olympic Country Club is performed by licensed personnel utilizing EPA-approved products. The golf course is not located in the Lake Merced watershed. Stormwater and irrigation water originating on the course percolates into the soil with little runoff. However, during very heavy rains, stormwater runoff from the northern and eastern portions of the course discharges into Vista Grande Channel, which is located on the north and east borders of the club, and occasionally floods a portion of the course as shown on Figure 3-1 and Photograph 16. Stormwater runoff containing pesticides from the golf course could impact Lake Merced during periods of channel overflow into the Lake. Continued monitoring of Vista Grande Channel will provide the best indicator of the impact of golf course runoff on Lake Merced during overflow events.

Water used for irrigation of the Olympic Country Club golf course originates from groundwater wells which are owned and operated (including periodic sampling) by the Olympic Country Club. Normal irrigation of the entire course may use 700,000 to 800,000 gallons daily; however, during the dry season, quantities in excess of one million gallons daily, five days per week, may be used. Similar to Harding Park and Jack Fleming courses, the quantity of irrigation water does not reportedly create runoff.

3.2.7 Recreation

The Lake Merced watershed is used for non-contact recreation including sport fishing and boating, golfing, skeet shooting, bicycling, jogging, and walking. The following text presents each recreational activity and its potential effect on Lake Merced.

Fishing

Fishing is allowed seven days a week, from one hour before sunrise to one hour after sunset throughout the year. Fishing generally takes place from designated shorelines, fishing piers, float tubes, and boats on both the North and South Lakes. Fishing in the shallow Impound Lake is only allowed from the shoreline in areas not lined by bulrush. Fishing activities and associated equipment at Lake Merced are operated and maintained by the Lake Merced Boating and Fishing Company. The location of fishing piers and beaches are shown on Figure 2-5.

The major contributor of contaminants associated with fishing is discarded debris (solid waste). Trash receptacles are located at the designated fishing areas; however, the receptacles provided are not always used. Trash discarded from fishing areas can be blown or washed into to the Lake, which can influence water quality (see Photograph 17). This trash can also collect in isolated areas, which can influence the rodent population around the Lake. The quantity of trash associated with fishing encountered during the field investigation was minimal.

Boating

Boating is another high-use recreational activity at Lake Merced. Rowboats, fishing boats, paddle boats, windsurfing, and canoeing are allowed on both North and South Lakes. Sculling is only allowed on South Lake. Electric motor boats are only allowed on North Lake. Gasoline-powered boats are prohibited on all of the lakes, with the exception of two emergency patrol boats. Because gasoline-powered boats are prohibited, potential constituents associated with gasoline exhausts are minimal.

Golfing

HPMGC encompasses approximately 150-acres between North and South Lakes. The golf courses are heavily used by the public and requires extensive maintenance. The major contaminants of concern are nutrients from herbicides, pesticides, and fertilizers. A detailed discussion of the contaminant sources has been provided previously in Section 3.2.6.

Trap and Skeet Shooting

The Pacific Rod and Gun Club operates and maintains a skeet shooting range adjacent to South Lake. A portion of the South Lake shoreline is used as a backdrop. An interview was conducted with Mr. Woodrow Hervé, a former employee and long time member of the gun club, regarding current and historical operation.

Due to the nature of this sport , the ground between the shooter and the Lake is littered with broken and unbroken clay targets and plastic wads from shells. According to Mr. Hervé, the soil in this area is sandy and very little stormwater runoff occurs. However, some erosion has occurred due to surrounding developments. The gun club has two to three days annually when spent clay targets and plastic wads are collected from the grounds. The materials contained in the spent clay targets and plastic wads do not present a significant source of contaminants to the Lake. Lead has been detected in the soils and aquatic sediments at the gun club. See Section 3.2.1 for a detailed discussion.

General Activities

The remaining recreation activities include the general daily use of the area by pedestrians (i.e. walking, biking, jogging, etc.), picnics, and general visitation. These activities can create water quality deterioration by litter entering the lake, erosion from unauthorized trails, and contamination from human waste.

Litter which is not properly discarded can present a potential source of contamination. Trash receptacles are placed along highly traveled areas, the golf courses, and along the beach areas; however, they are not always utilized (see Photograph 18). The litter is often blown into the Lake if it is not properly disposed. Erosion from unauthorized trails can also cause additional sediments to be washed into the Lake during wet weather.

To reduce the risk of contamination from human waste, public restrooms are located at HPMGC, Lake Merced Fish and Boating Company, and the Pacific Rod and Gun Club, and several portable restrooms are located on the golf courses. However, if these public restrooms are not conveniently located, Lake users may urinate or defecate in other places around the Lake. Although no evidence of this practice was observed during the survey, City staff have received reports of its occurrence.

No homeless people were observed at Lake Merced by CDM during the field visits. As reported by Mr. Mike Casazza, gardener for Lake Merced, there are occasional sightings of vagrants in the wooded areas of Lake Merced south of LMPS. No permanent encampments have been reported. (SFRPD, 1999c)

3.2.8 Solid Waste

Solid waste is collected in trash receptacles located throughout the area, including along the pedestrian walkway around the Lake, golf courses, picnic areas, and parking areas. Large dumpsters are used for the collection of solid waste associated with buildings (e.g. The Boathouse Restaurant, golf course restaurant, and Pacific Rod and Gun Club) that generate a larger quantity of waste (see Photograph 19). These trash receptacles and dumpsters present a minor source of contaminants; however, the areas in the vicinity of the dumpsters have become areas of unauthorized dumping or “storage” of obsolete objects.

As infiltrating rainwater seeps through uncovered waste material, it may come into contact with various contaminants. This rainwater combines with stormwater runoff and has the potential of directly or indirectly affect the quality of Lake Merced.

3.2.9 Traffic Accidents/Spills

Traffic accidents and spills are potential sources of contaminants to Lake Merced since transported fluids from the vehicles can be transmitted to the Lake via the stormwater collection system. Traffic accidents also have the potential for the release of petroleum products from vehicles. Factors that affect the level of risk for vehicle spills include overall traffic volume, quantity of hazardous materials being transported, highway characteristics, road conditions, and weather. There are no prohibitions on the transport of hazardous materials within the Lake Merced watershed.

The potential for traffic accidents increases during the rainy season (typically late November through February) on the roads in the watershed: Lake Merced Boulevard, John Muir Drive, and Skyline Boulevard. During this same part of the year, the potential for runoff and stormwater flows are at their peak. During this time, even dry materials could be transported by the runoff directly into the Lake.

3.2.10 Unauthorized Activity

According to Mr. Casazza, the Lake Merced gardener, constant illegal dumping occurs at Lake Merced. Items such as used batteries, oil and paint containers, tires, large appliances, and automobiles are found most commonly near the parking areas. These items are transported to the SFRPD Corporate Yard, tested for chemical properties if necessary (e.g. paint containers), and disposed of properly. (SFRPD, 1999c)

3.2.11 Seawater Intrusion

Seawater intrusion has been reported in Westside Basin groundwater wells. At Lake Merced, the water surface elevation is higher than the ocean and groundwater movement is reported from east

to west towards the Pacific Ocean. Data collected from a 1990 USGS study showed no evidence of seawater intrusion at the time of the study (USGS, 1990). Based on this information, no specific study or monitoring was identified in this sanitary survey to evaluate seawater intrusion into Lake Merced.

4

Section Four

Section 4
Lake Merced Water Quality

4.1 Guidance and Criteria

Lake Merced has served a number of functions for San Francisco. Most importantly, has been transformed from a municipal water supply in the late 1800's to its present use as a potential emergency water supply.

The California SWTR requires a watershed sanitary survey be performed for every water supply watershed, although there is no specific requirement for a watershed survey of a potential emergency supply. However, the sanitary survey remains an excellent tool to be used to determine potential sources of contamination of drinking water within a watershed. The investigative nature of the sanitary survey also allows its use as a baseline report regarding the water quality and condition of the watershed. Since the Lake has uses other than emergency water supply, a goal of this sanitary survey is the review of the water quality with respect to the beneficial uses of Lake Merced as listed in the Basin Plan. As described in Section 2, the beneficial uses are potential municipal and domestic supply, water contact and noncontact recreation, fish spawning, and warm and cold freshwater habitat. The definitions for these beneficial uses are listed in Appendix E.

The Basin Plan sets forth water quality objectives for surface waters in the San Francisco Bay Basin. These objectives protect the beneficial uses and high quality waters of the state. Many of these objectives have specific numerical limits or narrative requirements for water quality. The water quality monitoring program described below has been designed to measure compliance with these objectives.

4.2 Water Quality Monitoring Program

Lake Merced water quality is determined by the existing quality of water in the Lake and the quantity and quality of the water which is introduced into the Lake. This section includes a description of the existing and planned water quality monitoring programs for the Lake and each of its water sources.

4.2.1 Lake Merced Water Quality Monitoring

The WQB conducts water quality monitoring of Lake Merced. Samples are collected at the surface of both the North and South Lakes. Limnology profile sampling is conducted quarterly by collection of samples at various depths in North, South, and East Lakes. The sampling and analysis descriptions are included in the following paragraphs.

Routine Weekly Sampling of Lake Surface Water Quality

Monitoring of North and South Lakes by the WQB consists of single surface grab samples taken weekly from North and South Lakes. These samples have been analyzed for the following parameters, beginning in 1958:

- Temperature
- pH
- Turbidity
- Conductivity
- Alkalinity
- Hardness
- Chlorides
- Bacteria (Total Coliform)
- Color

Comprehensive Quarterly Lake Profiling

Beginning in February 1997, quarterly limnological monitoring began on North, East, and South Lakes. Typically, four locations at the Lake are profiled, with samples collected at five foot intervals of depth. Profiling locations were selected at the deepest point in each Lake, with two locations needed in South Lake due to its size.

The following are the testing parameters typically measured in the monitoring of the physical, chemical, and biological conditions within the profile at Lake Merced:

- Temperature
- pH
- Turbidity
- Conductivity
- Alkalinity
- Hardness
- Chlorides
- Total Dissolved Solids (TDS)
- Dissolved Oxygen
- Oxidation Reduction Potential
- Nitrate Nitrogen
- Ammonia Nitrogen
- Orthophosphate
- Total Phosphorous
- TOC
- Fluoride
- Bromide
- Sulfate
- Iron
- Manganese
- Methyl-Tertiary-Butyl Ether (MTBE)
- Secchi Disk Measurement
- Plankton Identification and Enumeration
- Chlorophyll a
- Algal Biomass

Nitrogen and phosphorus concentrations in a lake are very important limnological parameters. These nutrients often serve to trigger algae blooms that can frequently impact the aesthetic qualities of a lake. Dissolved oxygen concentrations and pH levels are equally important parameters to be measured since their levels can correlate with the start of a sudden phytoplankton population increase. Monitoring of dissolved oxygen and pH levels is of particular importance as the lakes move into the summer stagnation period. The Basin Plan states that testing for *chlorophyll a* is a critical indicator of algal biomass in a lake or reservoir, which when in excess, decreases recreational beneficial use.

4.2.2 Lake Merced Inflow Water Quality Monitoring

The potential sources of water to the Lake include direct rainfall, dechlorinated SFPUC imported potable surface water from the distribution system, groundwater, and stormwater runoff. The dechlorinated SFPUC imported potable surface water is introduced to the Lake at the Lake Merced Pump Station through the procedures described in Section 2. Groundwater will enter or leave the Lake depending on the relationship between the underlying groundwater basin and lake water surface elevations. Stormwater runoff from adjacent impervious surfaces also enters the Lake. Of the inflow sources, SFPUC imported potable surface water, groundwater, and stormwater are sampled and analyzed to measure water quality. A description of the monitoring programs for each source is provided in the following paragraphs.

SFPUC Imported Potable Surface Water Inflow

The highest quality water source to the Lake is SFPUC imported potable surface water, since it must be suitable for domestic consumption. The WQB is responsible for monitoring the quality of potable water as it leaves the treatment facilities and is conveyed throughout the distribution system. The WQB monitors a range of organic, inorganic, and microbiological parameters at various frequencies and locations as required by State and Federal regulations.

The water quality is tested at the SFPUC drinking water treatment plants to make sure it meets DHS drinking water regulations before being distributed into the drinking water system. At the treatment plants, water quality is monitored continuously for turbidity and chlorine residual. The pH is monitored every four hours. Samples for total and fecal coliforms are collected daily. Other parameters monitored on a quarterly or annual basis are metals and synthetic organic compounds. These results are summarized in the SFPUC's Annual Water Quality Report and all parameters comply with State and Federal drinking water regulations.

When the water is being conveyed throughout the drinking water distribution system, the primary concern is maintaining water quality after it leaves the treatment plants. To monitor this quality, a more limited set of parameters is tested in a number of locations throughout the distribution system. Chlorine residual, pH, temperature, total coliforms, and fecal coliforms are monitored on a weekly basis at dozens of locations in the SFPUC's distribution system. These locations include special taps located on service mains, customer taps, and reservoir outlets. The frequency and location of this testing is determined by State and Federal drinking water regulations and by SFPUC operational needs.

Groundwater Inflow

The water quality in Lake Merced is influenced by the quality in the underlying Westside Basin. A Westside Basin Groundwater Management Plan is currently under development by the SFPUC to facilitate the understanding of how the various groundwater users can manage groundwater issues (including quality) in the basin.

A groundwater quality and water surface elevation monitoring program for the Westside Basin was developed in 1997. This plan called for groundwater quality monitoring at existing and proposed wells to evaluate potential impacts from point and nonpoint sources of contamination, saltwater intrusion, and the potential for the wells to be used as sources of potable water. A water surface elevation monitoring program for levels in 15 wells in the vicinity of Lake Merced is planned as part

of the Groundwater Management Plan, but the monitoring will not include water quality analyses (AGS, 1997). It is CDM's understanding that this monitoring program has not been implemented. Therefore, there are no current ongoing groundwater quality monitoring programs in the area near Lake Merced.

The Groundwater Management Plan included special one-time water quality testing of a number of wells in the Westside Basin. The two wells closest to the Lake Merced area which were tested are the Zoo Well No. 3 and the OWPCP Well. Both were measured most recently in November 1993 for general water quality parameters, metals, and synthetic organic compounds. Based on USGS mapping of groundwater in the area (USGS, 1990), both of these wells are downgradient from the Lake. Groundwater quality monitoring for upgradient wells was performed during 1987 and 1988 by the USGS (USGS, 1990). The nearest well upgradient of the Lake is the San Francisco State well which was last sampled in 1988.

Direct Stormwater Inflow and Vista Grande Channel Overflow

Stormwater can enter Lake Merced via a number of drain inlets on the roadways and parking lots surrounding the Lake. Prior to the stormwater program initiated in 1998, the City did not have any information regarding water quality entering the Lake through the drain inlets. Stormwater from an overflow of the Vista Grande Channel can also be a source of water to the Lake. The City of Daly City has performed some sampling and analysis of stormwater runoff in the Vista Grande Channel in the past. However, the stormwater sampling and testing frequency have not been consistent, being done in 1984, 1993, and most recently in April 1998. The recent analysis included testing for heavy metals, chlorinated and organophosphate pesticides, polychlorinated biphenyl (PCB), and polyaromatic hydrocarbons (PAH), as well as an aquatic toxicity bioassay.

The current stormwater sampling and analysis program for areas near Lake Merced is performed by the WQB and the Water Pollution Prevention Program (WPPP). The WPPP is part of the Pretreatment Section of SPEAC within the SFPUC. The WPPP is responsible for two stormwater analysis projects including the Lake Merced Stormwater Demonstration Project and the sampling of the Vista Grande Channel stormwater flows as described below.

In the Lake Merced Storm Water Demonstration Project, WPPP is working with manufacturers of stormwater treatment equipment in a demonstration project to determine the effectiveness of the treatment units. WPPP will be responsible for monitoring of stormwater flows and quality, with the manufacturers responsible for cleaning and maintenance of the units. Two types of treatment units were installed at the lake: Continuous Deflective Separation (CDS) units and a CSF$^{(R)}$ Stormwater Treatment System (StormFilter).

In March of 1998, two CDS units were installed in areas where stormwater runoff was draining to Lake Merced. The primary purpose of the CDS units is the removal of litter and debris from stormwater and potential removal of coarse and fine sediments and their attached pollutants. The units were installed along the southern portion of John Muir Drive in an area where heavy storms had created an overflow of the Vista Grande Channel and subsequent washout of a portion of the road (see photograph 20). Both units provide service for drainage areas of less than 5 acres.

A StormFilter treatment unit was installed in the parking lot area north of The Boathouse Restaurant on Harding Park Road in the spring of 1998 (see photograph 21). The primary target

pollutants for this unit are sediments, total and soluble phosphorus, total nitrogen, nitrates, soluble metals, and oil and grease.

The planned monitoring program for 1998/99 will include the influent and effluent monitoring of the three stormwater treatment units, as well as a conventional drop inlet site as a comparison. Six storm events will be sampled and analyzed for the following constituents:

- Chemical Oxygen Demand
- Total Suspended Solids
- Total Recoverable Oil and Grease
- Hydrocarbon Oil and Grease
- Phenols
- Heavy Metals
- Chlorinated and Organophosphate Pesticides
- PCB
- PAH
- Dioxin (one storm only)
- Toxicity Bioassay Test (one storm only)

To determine the range of stormwater quality occurring within the Vista Grande Channel watershed, WPPP is planning to sample stormwater at three sites. The sites include a location in the Daly City watershed, a location to determine water quality of Olympic Country Club runoff, and a location in the channel to determine the quality of water which could overflow into Lake Merced. In addition to testing for the same constituents analyzed in the stormwater demonstration project, other constituents analyzed will include total phosphorus, nitrogen (Total Kjeldahl), turbidity, and TOC.

4.3 Existing Water Quality

A description and summary of recent water quality testing for the Lake and each of its sources is included in the following paragraphs. A complete listing of the source water quality data which is summarized in this section is included in Appendix G.

4.3.1 Lake Merced Water Quality

Based on the wide range of sampling and testing performed by the WQB, there is individual information available for the North, South and East Lakes of Lake Merced. As noted in Section 4.2.1, the weekly surface sample monitoring results are available for the period since 1958. The quarterly limnological profiles of the Lake are only available since 1997.

This sanitary survey is performed primarily to obtain a current "snapshot" of the Lake and its sources of contamination. To provide a preliminary analysis of water quality, the water quality information from the surface samples obtained in 1998 has been summarized in Table 4-1. This table includes both the range of values and the average of the monitoring information available for both North and South Lakes.

Table 4-1
Lake Surface Water Quality

Water Quality Parameter	Units	North Lake		South Lake	
		1998(1) Average	1998 Range of Values	1998(1) Average	1998 Range of Values
Temperature	°F	61.3	51-70	60.7	51-70
pH	Unit	8.5	8.1-9.0	8.3	7.7-9.0
Turbidity	NTU	23.1	8.7-54.0	13.4	4.3-25.0
Conductivity	us/cm	738	680-830	552	503-671
Alkalinity	mg/l	256	192-284	181	160-264
Hardness	mg/l	246	178-272	177	160-252
Chlorides	mg/l	84	66-93	63.5	58-88
Bacteria (Total Coliform)	MPN/ 100ml	397	4-3,000	457	23-5,000
Color	CU	222	90-340	133	56-200

(1) Data from the first week of every month was used.

The quarterly limnological profiles performed for Lake Merced include analysis of a number of constituents which are not measured in weekly samples. To provide a simplified summary of the water quality from these measurements, the water surface average values and ranges are listed in Table 4-2. The change with each of these constituents with depth can be observed in the graphs presented in Appendix G which include data sheets with written observations. For most of the constituents, the concentration remains fairly constant throughout the water depth. However, values for dissolved oxygen, temperature, and pH generally decrease with depth for profiles done during the summer months. Note also the observations made by the limnologist on algal biomass, blue-green algae species, stratification, etc. A working database of lake water quality observations is being constructed through these quarterly reports.

Table 4-2
Comparison of Limnological Profiles: 1998 Quarterly Samples

Water Quality Parameter	Units	North Lake		East Lake		South Lake (Location 1)		South Lake (Location 2)	
		Average	Range	Average	Range	Average	Range	Average	Range
Temperature	°C	15.8	9.6-19.6	15.1	8.6-19.3	15.4	9.2-19.5	15.7	9.1-19.6
pH	Unit	8.62	8.44-8.79	8.21	8.00-8.38	8.35	8.16-8.44	8.43	8.27-8.76
Turbidity	NTU	24.6	10.0-32.6	20.8	6.7-32.2	13.2	8.4-18.0	15.8	9.8-22.0
Conductivity	umhos	784	728-864	734	706-762	574	547-590	565	544-585
Alkalinity	mg/l	246	233-255	233	214-250	172	162-180	169	155-180
Hardness	mg/l	243	231-251	240	218-254	176	157-185	177	156-185
Chlorides	mg/l	85	82-89	78	66-92	63	58-68	63	58-68

Table 4-2
Comparison of Limnological Profiles: 1998 Quarterly Samples

Water Quality Parameter	Units	North Lake		East Lake		South Lake (Location 1)		South Lake (Location 2)	
		Average	Range	Average	Range	Average	Range	Average	Range
TDS	mg/l	493	466-518	463	442-488	362	350-375	356	333-374
Dissolved Oxygen	mg/l	9.3	8.6-9.8	8.5	6.9-11.5	9.0	7.9-10.6	9.5	8.0-10.6
Oxidation Reduction Potential	mil.V	300	264-373	303	262-335	306	286-358	299	287-322
Nitrate Nitrogen	mg/l	--	ND	--	ND	--	ND	--	ND
Ammonia Nitrogen	mg/l	0.04	0.02-0.06	0.03	0.02-0.03	0.04	0.03-0.06	0.03	0.03
Orthophosphate	mg/l	0.12	0.11-0.12(3)	0.12	0.03-0.19	--	ND	--	ND
Total Phosphorous	mg/l	0.18	0.09-0.31	0.18	0.07-0.28	0.08	0.05-0.11	0.08	0.05-0.11
TOC	mg/l	8.7	7.7-9.7	7.8	6.6-8.8	6.5	5.9-7.1	6.3	5.4-6.9
Fluoride	mg/l	0.11	0.10-0.11(3)	--	ND	0.31	0.29-.036	0.31	0.29-0.36
Bromide(1)	mg/l	--	0.42	--	0.35	--	0.26	--	0.26
Sulfate(1)	mg/l	--	16	--	26	--	16	--	16
Iron(2)	mg/l	0.07	0.06-0.07	0.07	0.03-0.10	0.05	0.04-0.06	0.06	0.06
Manganese(2)	mg/l	0.19	0.14-0.23	0.20	0.15-0.24	0.15	0.08-0.16	0.11	0.06-0.16
MTBE	ug/l	--	ND	--	ND	--	1.9(4)	--	1.9(4)
Secchi Disc	feet	1.3	1.0-2.0	1.5	1.0-2.0	1.9	1.5-2.5	1.9	1.5-2.5
Plankton	No./cuM	9.7×10^{8}	1.5×10^{8} - 1.8×10^{9}	7.3×10^{8}	2.0×10^{8} - 1.7×10^{9}	3.6×10^{8}	1.2×10^{8}-5.4×10^{8}	3.2×10^{8}	8.7×10^{7} - 7.0×10^{8}
Chlorophyll a(2)	ug/L	55.3	27.4-83.2	50.4	43.2-57.6	51.5	27.8-75.2	44.6	17.7-71.6
Algal Biomass(2)	ug/L	3703	1836-5570	3377	2894-3860	2675	1789-3560	2983	1186-4780

Samples Collected on March 16, July 8, September 23, and December 22. Data listed are surface readings.
ND = Not detected greater than laboratory reporting limit
(1) Sampled once
(2) Sampled twice
(3) Detected twice
(4) Detected once.

4.3.2 Lake Merced Inflow Sources Water Quality

SFPUC Imported Potable Surface Water Inflow

The potable water distribution system near the Lake Merced Pump Station is part of the Sunset service area and is supplied by water from the Harry Tracy Water Treatment Plant, the Hetch Hetchy Aqueduct, and/or the Sunol Valley Water Treatment Plant. Water quality samples are collected from the Sunset No. 6, No. 9, and Outlet No.1 and 2 locations in the distribution system which are in the Lake Merced area of the City. The water quality at these locations is assumed to be

typical of that which would be discharged to Lake Merced during Lake filling events. The average of the weekly values for these locations is included in Table 4-3. The typical range of water quality values measured in 1996 for commonly monitored parameters is shown below.

Chlorine:	0.5 to 1.0 milligrams per liter (mg/l)
pH:	8.5 to 9.2
Temperature:	60 to 70 °F
Coliforms:	None (Total or Fecal)

Although water quality in the SFPUC distribution system is excellent, the residual chlorine in the water has potential to effect Lake water quality. Chlorine is removed from the water at the LMPS prior to being discharged into the Lake.

Groundwater Inflow

The most recent groundwater quality analyses have been performed in conjunction with the Westside Basin Groundwater Management Plan. The water quality information listed in Table 4-3 for the two wells downgradient of the Lake is the average of the two samples collected in November 1993. One sample was collected at each of the Zoo Well No. 3 and the OWPCP well locations (CH2M HILL, 1998b). With exception of manganese, all constituent concentrations were at levels below drinking water standards. Although the average manganese concentration of the two wells is below the drinking water standard, the manganese level of 70.9 mg/l in the OWPCP well exceeded the California Secondary Maximum Contamination Level (MCL) of 50 mg/l. Synthetic organic compounds were not detected in either sample.

Table 4-3
Comparison of Lake Merced Inflow Sources Water Quality

Water Quality Parameter	Units	MCL's(1)	City Distribution System(2)	Up Gradient Ground-water(3)	Downgradient Groundwater(4)	Vista Grande Canal Stormwater(5)
Temperature	°C	--	18	21.5	--	15.5
pH	Unit	--	8.8	8.0	7.7	7
Conductivity	us/cm	900(S)	174	683	565	56
Turbidity	NTU	0.5 (P)	0.3	--	<1	22.5
Alkalinity	mg/l	--	49	228	155	16
Chlorides	mg/l	250 (S)	12	37	53	5.2
Hardness	mg/l	--	--	--	210	38
Bacteria(Total Coliform)	MPN/ 100ml	Absent (P)	Absent	--	<2	220,000
Color	Unit	15 (S)	--	--	<10	--
Nitrogen (total as N)	mg/l	10 (P)	--	7.6	6.2(nitrate)	--
Dissolved Oxygen	mg/l	--	--	--	--	7.8
Oil and Grease	mg/l	--	--	--	--	3.0
Total Suspended Solids	mg/l	--	--	--	--	44.5

Table 4-3
Comparison of Lake Merced Inflow Sources Water Quality

Water Quality Parameter	Units	MCL's[1]	City Distribution System[2]	Up Gradient Ground-water[3]	Downgradient Groundwater[4]	Vista Grande Canal Stormwater[5]
Total Dissolved Solids	mg/l	500 (S)	--	--	305	41.5
Copper	mg/l	1.3 (AL)	--	--	<0.0015	0.012
Sodium	mg/l	--	--	59	40.6	4.2
Zinc	mg/l	5 (S)	--	--	--	0.10
Lead	mg/l	0.015 (AL)	--	--	<0.0015	0.046
Manganese	mg/l	0.05 (S)	--	--	0.038	--

-- Not Analyzed
[1] P = Primary; S = Secondary; AL = Action Level
[2] Average of 1996 weekly distribution system samples at Sunset No. 6, No. 9, Outlet No. 1 and 2 sampling locations.
[3] San Francisco State University Well Sampled 2-9-88 (USGS, 1990)
[4] Average of Zoo Well No. 3 and OWPCP well sampled in 11-93 (CH2M Hill, 1998b)
[5] Copper and zinc concentrations from 1998 sampling of Vista Grande Channel at Lake Merced Boulevard by City of Daly City. Other concentrations as reported in GeoResource Consultants, Inc. (1993)

A previous groundwater monitoring effort was completed by the USGS in the late 1980s (USGS 1990). The USGS study included water quality measurements of wells surrounding the Lake. The upgradient well nearest Lake Merced included in that study was the San Francisco State well. It was sampled three times in late 1997 and early 1998. The final sample did not include a full analysis of constituents, so the previous sample results were included in Table 4-3.

Direct Stormwater Inflow and Vista Grande Channel Overflow

At the time this sanitary survey was completed, the stormwater quality information collected by the WPPP during the 1998-1999 winter season had not been compiled. This data will include water quality of direct inflows to Lake Merced. This information will provide an excellent baseline for comparison of future stormwater analysis, and can be included in a future sanitary survey update. No earlier water quality analyses of stormwater discharges to Lake Merced have been performed.

Prior to the WPPP monitoring being completed, the most recent stormwater quality analysis on the Vista Grande Channel was done by the City of Daly City in April of 1998 and included testing for heavy metals, chlorinated and organophosphate pesticides, PCBs, and PAHs. With the exception of copper and zinc, the concentrations measured for all constituents were below the detection limit. An aquatic toxicity bioassay performed with the sample collected in 1998 produced a 100 percent survival rate for rainbow trout.

5

Section Five

Section 5
Lake Merced Control and Management Practices

This section includes a description of watershed control and management practices by agencies with authority within the Lake Merced watershed. Existing policies, practices, and regulations established to control potentially damaging activities within the watershed are identified.

5.1 Management of Lake Merced

5.1.1 General Management

Lake Merced was first developed as a drinking water source for the City by the Spring Valley Water Company. In 1930, SVWC sold the Lake Merced tract to the City, which currently manages the Lake through the SFPUC. Lake Merced was used as a potable water source for San Francisco until the Hetch Hetchy system went online. In 1950, the SFPUC passed a resolution authorizing the SFRPD the "right to occupy, use and improve for park and recreational purposes" the lands surrounding the Lake. The SFPUC has maintained ultimate responsibility for Lake Merced as it is a potential municipal water resource.

Although both the SFPUC and the SFRPD share in the primary management of the Lake, other City and County agencies exercise some authority over activities in the watershed. These agencies include the Department of Planning, the Department of Public Health, the Police Department, and the Department of Public Works. Regional, state and federal agencies have authority over the activities at the Lake. A summary of the agencies policies, practices and regulations with regard to watershed management are listed on Table 5-1.

5.1.2 Maintenance Activities

Maintenance activities performed at Lake Merced by SFRPD include trash pickup, restroom cleaning and maintenance, hazardous waste pickup, landscaping of lake grounds, and surveillance of park property around the 4.3-mile perimeter of the Lake. The maintenance is performed by a single full-time gardener. Up until the mid-1990's, SFRPD employed three people for lake maintenance. Based on the similar or potentially increased recreational usage of Lake Merced, the current level of maintenance may be inadequate. Since it appears that an increased level of maintenance activities at Lake Merced may positively effect water quality, it would be advisable to perform a study of the number of users and types of activities conducted at Lake Merced. This study would assist in evaluating whether increased maintenance is necessary.

5.1.3 Best Management Practices

The implementation of water quality controls and best management practices by concessionaires and other lessees at the Lake is vitally important in maintaining lake water quality. The SFRPD has included best management practice (BMP) components to the terms of lease agreement with each tenant. These components will reduce the potential for contamination from the lease sites.

Table 5-1
Summary of Policies, Practices, and Regulations Which Impact Water Quality

Agency/ Utility	***Primary Watershed Objectives and Activities***	***Policies, Practices, or Regulations Which Impact Water Quality***
SF Public Utilities Commission (SPEAC, WQB, CDD)	■ Protect emergency water supply ■ Minimize water quality changes ■ Avoid microbiological and chemical contamination ■ Control addition of potable water to Lake ■ Maintain and operate LMPS ■ Maintain water, sewer, and storm drain lines in jurisdiction	■ Monitoring of lake water quality and levels ■ Development of the Draft Lake Merced CMP ■ Development of San Francisco Integrated Water Resource Plan ■ Control of LMPS operations ■ Operation of dechlorination facility ■ Coordinate emergency use of Lake
SF Recreation and Park Department	■ Provide recreational facilities and lake stewardship ■ Reduce erosion on trails ■ Educate public regarding water quality issues ■ Maintain recreational areas and facilities ■ Administer lease and consignment agreements ■ Provide security to area	■ Development of Draft Lake Merced CMP ■ Maintenance of lake area including trash receptacles and bathroom facilities ■ Coordination of volunteer efforts for Lake cleanup and maintenance ■ Signage regarding recreational activities and other uses of the Lake ■ Agreements with concessionaires for water quality controls (controls described in greater detail in Table 5-2)
SF Department of Planning	■ Review of projects outside of water area, historic wetlands and tidelands	■ Implementation of CEQA process
SF Department of Public Health	■ Protect public health	■ Compliance with UST regulations ■ Hazardous materials and hazardous waste management ■ Inspection of concessionaire food facilities
SF Fire Department	■ Respond to emergency hazardous materials spills	■ Emergency containment of spills
Daly City	■ Maintain Vista Grande Channel	■ Cleaning of debris gates
CA Department of Heath Services	■ Protect water quality of drinking water sources	■ Requires a sanitary survey of watersheds used for drinking water supply. Update required at 5-year intervals. The Lake is currently exempt because of emergency status. ■ Coordinate and approve SFPUC emergency use of Lake water
CA Regional Water Quality Control Board	■ Adopt area-wide water quality control plans ■ Control/coordinate water quality issues ■ Control the quality/quantity of overflows of the combined sewer ■ Primary oversight of LUST sites	■ Enforcement power to issue permits with specific water quality requirements ■ Issue NPDES permits to specific entities for waters-of-the-state discharges ■ Establishment of water quality limits/objectives ■ 401 Water Quality Certification
CA Department of Fish and Game	■ Regulate lake activities with habitat impacts ■ Minimize impacts of watershed activities on aquatic habitat ■ Regulate species control programs and lake fisheries	■ Input into CEQA process for projects which affect California natural resources (California Code of Regulations [CCR] Title 14)
CA Department of Transportation	■ Maintain roadways ■ Design of drainage systems	■ Design Manuals and Best Management Practices Manual for reducing pollutant loading in runoff
CA Department of Toxic Substances Control	■ Regulate hazardous materials and hazardous waste use and management	■ Enforcement power of CCR Title 26
CA State Lands Commission	■ Jurisdiction and ownership of lake bottom land	■ Preparation and comment on CEQA process ■ Review of permit applications submitted to Army Corps of Engineers
Army Corps of Engineers	■ Oversight of shoreline and lake bed alterations	■ 404 and nation-wide permit process

The effectiveness of these components was assessed during the sanitary survey field inspections. The BMP components for each tenant, as well as the survey observations, are listed in Table 5-2.

Table 5-2
Pollutant Reduction BMPs for Leased Property at Lake Merced

Property	Tenant	Terms of Agreement	BMP Components Listed in Lease	Field Observations on Lease Compliance
Harding and Fleming Golf Courses and Pro Shop	Arnold Palmer Golf Management LLC	Month-to-month lease.	Lessee must store and dispose of waste properly.	Based on field survey, lessee is generally in compliance.
Harding Park Golf Course Restaurant and Bar	Ben Tsutomo Yamane and Shizuko Yamane	February 1987 to January 2003	Lessee must store and dispose of waste properly.	Based on field survey, lessee is generally in compliance.
Lake Merced Boathouse Bar and Restaurant	Chor Oong Lee and Kyong P. Lee	June 1997 to May 2002	Lessee must store and dispose of waste properly. The City has the right to construct and maintain any structures related to the water supply system. The City can assume control of the buildings during a water supply emergency.	Based on field survey, lessee is generally in compliance; however, minor litter was present.
Lake Merced Boating and Fishing Company	Urban Parks Concessionaires	December 1986 to December 1996. Five-year extension or month-to-month lease granted afterwards.	Lessee will not issue permits to allow boats on Lake Merced that have a sink drain, flush toilet, or gas motor. Lessee must store and dispose of waste properly, and will share responsibility for trash around the picnic areas.	Litter appears to be a problem in the picnic area along Harding Park Road. Lessee may be out of compliance since lessee shares responsibility for keeping this area clean.
Pacific Rod and Gun Club	Pacific Rod and Gun Club	Month-to-month lease	Lessee must store and dispose of waste properly. Lessee must protect any water supply structures erected by the City on the property and prevent any activity that would contaminate Lake Merced.	Based on field survey, lessee is generally in compliance. Lead shot previously deposited in the Lake could have an effect on water quality.

Note: SFPD Range land is owned by SFPD and is not a tenant managed by SFRPD.

Erosion Control and Stormwater Regulations

SFRPD manages the land surrounding Lake Merced. According to the City staff, there are no SFRPD-wide erosion control, soil management, or stormwater policies or regulations (SFRPD, 1999d).

5.2 Emergency Plans

In the event of an emergency, Lake Merced water could be used for firefighting, drinking water, or to maintain pressure in the SFPUC distribution lines. At the present time, there is no formal emergency plan that documents the procedures or requirements for using Lake Merced in an emergency. This deficiency is identified in the Draft Lake Merced CMP and addressed as action item WRS-1.7, Develop a Lake Merced Emergency Operations Plan.

Water could be pumped from the Lake in one of two ways: by the Lake Merced Pump Station or direct pumping. LMPS can draft water from the Lake for distribution into the reservoirs for emergency use using two pumps designated for emergency use. Direct pumping can be achieved by using San Francisco Fire Department (SFFD) fire trucks. Lake Merced water can be transported through the western half of the City for firefighting, or to the SFFD's Auxiliary Water Supply System.

Since Lake Merced water does not meet current drinking water standards, the introduction of the water into the distribution system would create a health hazard. If the water is pumped into the distribution system, the minimum requirements from the DHS would be issuance of a Boil Water Order and an Unsafe Water Alert. No permanent disinfection process exists at LMPS. A portable chlorination system exists at the WQB Millbrae yard and can be made available for Lake Merced if necessary. The emergency plans to introduce the water into the distribution system should be reviewed and approved by DHS. Water used for firefighting would require screening but not disinfection.

In the event of a chemical release or spill at the Lake, SFFD Battalion 2 would respond to the emergency. The SFFD's Hazardous Materials team would assist if necessary.

6

Section Six

Section 6
Conclusions and Recommendations

The Draft Lake Merced CMP identified three primary beneficial uses for Lake Merced: potential municipal water resource, regional recreation resource, and significant natural resource and education area (SFPUC/SFRPD, 1997). Goal 3 of the CMP's Water Resources Program Area Goals is to "protect and enhance water quality for the appropriate, identified beneficial uses." Goal 3 specifies that a watershed sanitary survey should be conducted to provide a "snapshot" of the Lake's current water quality and a baseline to quantify and monitor changes to the system. To accomplish this, the survey activities included:

- Identification of the water quality parameters currently being monitored,
- Identification of potential contaminant sources which could influence Lake Merced water quality and impact the beneficial uses, and
- Summaries of the recent sampling and testing results of each of the parameters to characterize the current lake water quality.

The conclusions reached in each of these activities are summarized in the following paragraphs.

6.1 Water Quality Measurements for Beneficial Uses of Lake Merced

Water quality information is collected by two SFPUC divisions, WQB and SPEAC. WQB collects data monthly and quarterly from the Lake to characterize water quality within the Lake. WQB also analyzes weekly potable water that is representative of the potable water that is imported into the Lake. SPEAC collects stormwater samples to aid in characterizing stormwater runoff quality into the Lake, and to specify pretreatment criteria if required. The combined current monitoring program provides a reasonable overview of current Lake Merced water quality.

6.2 Potential Contaminant Sources

Based on the survey findings, the sources listed in Table 6-1 could potentially contribute contaminants into Lake Merced. The potential significant sources include contaminant transport by groundwater, treated water blowoff without dechlorination, stormwater, or combined sewer overflows; pesticides and herbicide use; recreational activities which leave litter and other solid wastes; and spills created by accidents or dumping along the roadways surrounding the Lake. The supporting information and observations regarding each of these sources are provided in Table 6-1. The relative magnitude of each of the potential contaminant sources is not known. Further study is recommended in most cases to determine which contaminants have the most impact.

Table 6-1
Potential Contaminant Sources in the Lake Merced Watershed

Contaminant Source	Supporting Information and Observations	Recommendations
Groundwater Transport of Contaminants	One LUST is located within one-quarter mile of Lake Merced.	Include testing for petroleum products in groundwater and lake water quality monitoring.
	Nitrate present in the exfiltration from the combined sewer system can enter the groundwater and be discharged to the Lake.	Implement 1997 groundwater quality monitoring program, including testing for nitrates.
Stormwater Overflow from Vista Grande Channel	Stormwater overflow has occurred when the channel outfall capacity was exceeded. Water quality of stormwater overflow is not known.	Review 1998/99 SPEAC water quality monitoring data from channel to determine possible impacts to Lake and develop future channel monitoring program. Provide regular maintenance on channel to prevent back-up due to clogged debris. Review Daly City monitoring program for adequacy in preventing overflows.
Combined Sewer Overflow	Three direct sewer overflow locations are shown on maps of sewer collection system surrounding Lake. The overflow structures were not accessed during site visits. City staff believe overflows have been removed; however, no records are available regarding overflow removals.	Perform a field inspection to access the overflow locations to verify they have been removed. Remove from service if still connected.
	Overflow at manholes on combined sewer may occur during peak flows in wet weather events. This overflow would drain into the lake via storm drain inlets around the Lake.	Perform a study to determine the return period for overflows of sewers in the Lake Merced area.
Stormwater from Surrounding Watershed	Water quality of stormwater from the Lake Merced watershed is not fully known.	Review 1998/99 SPEAC water quality monitoring data to determine possible impacts to Lake.
	Review of City sewer maps does not show storm drain inlets.	Perform comprehensive investigation of storm drain inlets around the Lake to determine connection to the combined sewer or lake discharge.
	The SFPD Range is currently required by DTSC to perform a PEA to assess environmental, ecological and health risk of lead on the site.	Review PEA to determine if runoff from the shooting range has potential to impact Lake water quality.
Pesticide/Herbicide Contamination	Pesticides and herbicides are used and stored on golf courses in the watershed.	Include testing of pesticides and herbicides in groundwater and lake water quality monitoring, especially near sites of potential runoff from the golf course. Include pesticide and herbicide use BMPs in lease agreements.
	Potential for contamination of groundwater and surface water if chemicals are not applied or stored properly.	Continue implementation of Integrated Pest Management Plan and current practice of proper storage.

Table 6-1
Potential Contaminant Sources in the Lake Merced Watershed

Contaminant Source	***Supporting Information and Observations***	***Recommendations***
Unplanned Treated Water Discharge	Blowoffs from treated water pipeline must be dechlorinated before discharge.	Verify readiness of dechlorination facilities.
Recreation	Lake receives heavy non-contact recreation use. The major contaminants associated with this recreational use include:	Perform usage study of the Lake to identify/quantify effects of recreational use on water quality.
	Litter and other discarded debris left by lake users. Trash receptacles are placed at designated locations around the Lake, but are not always utilized.	Evaluate adequacy of existing waste disposal program.
	Sediments can be washed off trails if erosion management controls are not in effect. Some trails with erosion are not authorized.	Post signs and/or close trails where erosion or wildlife disturbance is problematic.
	Human waste products (urine and feces) from Lake users.	Evaluate adequacy of restroom facilities in usage study.
	Shooting at the Pacific Rod and Gun Club has deposited lead shot in the Lake. An enforcement order is still pending against the Club from the Regional Water Quality Control Board. Studies have shown little impact to lake water quality from lead shot.	Continue review of lead monitoring and cleanup efforts performed by the Club.
Solid Waste	Dumpsters are used where appropriate, although some dumpster areas have become 'storage' for obsolete objects. Contaminants from uncovered waste can be carried into the Lake by runoff.	Suitable storage areas and cover of wastes should be provided where feasible. Incorporate water quality protection through land use management into new leases.
Traffic Accidents/Spills	No restrictions on hazardous materials transport on roads surrounding lake. Spills can flow directly to the Lake through storm drain inlets.	Investigate areas where guardrails or decreased speed requirements may be beneficial.
Unauthorized Activity	Illegal dumping occurs at parking lots and other areas along the shoreline.	Keep records of illegally dumped materials to determine the cost-effectiveness of additional surveillance. Increase security provisions.
Seawater Intrusion	Past studies have assumed groundwater outflow west from the Lake to the ocean. This westward flow of water would prevent seawater intrusion to the Lake; however, no data on seawater intrusion exists.	Implement 1997 groundwater monitoring program which includes provision for seawater intrusion monitoring.

6.3 Water Quality Monitoring

The responsibility of the two SFPUC divisions for collection of data is listed in Table 6-2. The City has not evaluated the Lake data for trends or performed any comparative analysis of Lake water quality data on a regular basis.

Table 6-2
Water Quality Monitoring Responsibility in the Lake Merced Area

Water Supply Source	***Organization that Performs Water Quality Monitoring***
SFPUC Imported Potable Surface Water	WQB - Water Quality Laboratories
Lake Merced Water	WQB- Water Quality Laboratories
Stormwater	SPEAC - The Water Pollution Prevention Program in the Pretreatment Section, also the City of Daly City (Vista Grande Channel)
Groundwater	None

An evaluation of ongoing trends of the Lake water quality data is recommended to detect the Lake impact from activities within the watershed area. For example, elevated coliform bacteria counts could be caused by contamination in stormwater, overflows from the combined sewer system, or leaching from the sewer system. Other useful trends would be the difference in water quality of the North and South Lakes after potable water additions, and seasonal potential for eutrophication.

6.4 Recommendations

The recommendations presented in this survey include both those for meeting the Lake's use as a potential municipal supply and those for the regional recreation resource and significant natural resources and education area uses listed in the Draft Lake Merced CMP. The recommendations are divided into four sections, those for identification of potential contaminant sources, those dealing with watershed management, those related to water quality monitoring, and those for program and infrastructure improvements.

6.4.1 Recommendations for Identification of Potential Contaminant Sources

A number of potential contaminant sources were identified at Lake Merced. At this time, there is not sufficient water quality data or contaminant source management detail to quantify source impact to the Lake. Table 6-1 includes a number of recommendations for further study of the potential contaminant sources. These studies must include the corresponding water quality monitoring programs to verify the source influence on Lake water quality.

6.4.2 Watershed Management Recommendations

Most of the ongoing Lake Merced watershed management efforts are performed by different divisions or bureaus under the SFPUC or SFRPD. This separation of responsibilities creates difficulties in coordinating a watershed management program. The following recommendations are made:

- Establish the division or agency with overall responsibility of watershed management and specifically define the management responsibilities of each division for the Lake Merced watershed.
- Establish a watershed management plan which includes:
    1. Establishment of an integrated water quality evaluation program. This program would store and evaluate all water quality data and hydrology information that is collected. The information would then be available in an easily accessible format for evaluating the effects of future changes to the Lake, such as changes in mixing between the individual lakes, increased potable water additions, and treated stormwater discharge. Section 6.4.3 further details recommended aspects of this program.

    2. Increased maintenance and surveillance at the Lake. The limited maintenance at the Lake has resulted in a buildup of trash around the Lake. Additional staff or volunteers could be used for maintenance activities within the Lake watershed. The public could also report activities within the watershed that can impact water quality. For example, a "hotline" telephone number could be established to report illegal, unauthorized, or detrimental activities. This number could be publicized by signage at the Lake.

    3. Implementation of an aggressive public education/involvement program to minimize contaminant loading. The program would encompass all potential contaminants to the Lake with a focus to inform the public of the ongoing water quality issues. The program may include additional signage at the Lake and educational pamphlets that may be mailed out or distributed at the concessionaires and lessees at the Lake.

    4. Continued investigation and implementation of feasible management practices. BMPs for controlling activities in a watershed have been developed by and are available from a variety of resource managers, including the Environmental Protection Agency, State Water Resources Control Board, United States Forest Service, National Park Service, AWWA, and Water Environment Federation. While good management is generally observed in the Lake Merced watershed, the effort could be improved through developing a list of BMPs that are specific to Lake Merced. These BMPs are related to control of land use, vegetation management, native and domestic animal control, recreation policies and practices, point and non-point discharges, lake level and flow management, emergency response, fire protection and response, public outreach, and any other activity that affects the beneficial uses of Lake Merced. The CMP contains some desired BMPs, as do the

existing lease agreements with tenants. These should be strengthened by developing and then implementing a unique list of BMPs for watershed management.

6.4.3 Water Quality Monitoring Recommendations

The following recommendations are made:

- Identify a Division or Bureau which will be responsible for management of the water quality information gathered for the Lake.
- Develop an inter-division monitoring and database system which can be used by all divisions for data input and analysis. The water quality information from the Lake and each potential Lake inflow source (drinking water, groundwater, stormwater) would be included, as well as information regarding lake water surface level and estimated flows. Information collected by other cities or agencies (e.g. Daly City) would also be included.
- Store the data in a database format to facilitate easier transmittal of the data to other agencies or to generate graphical water quality trends. The data can then be used by any division or agency for routine evaluations.
- Perform a preliminary mass balance calculation to evaluate the effect of different contaminant loadings on the overall lake and on the individual lakes from specific sources.
- Evaluate the data on a frequent basis (e.g. quarterly) to identify any adverse or improving trends and the underlying cause(s) of significant changes.
- Perform a comprehensive review of recent stormwater monitoring information, lake profile monitoring data, and hydrologic data to develop a comprehensive pollutant load analysis for Lake Merced.
- Implement the water quality monitoring program for groundwater in the Lake Merced area.

6.4.4 Program and Infrastructure Recommendations

The following recommendations are made:

- Monitor frequency of overflow events at the Vista Grande Channel. Assure that adequate maintenance is provided to keep the grizzly structure from becoming clogged.
- Evaluate alternatives to treat and discharge Vista Grande stormwater into Lake Merced. Because of the potential damage from the stormwater overflows from the channel, the existing capacity of the system must be enlarged, or the water should be treated and directed to Lake Merced.
- Field verify structural integrity, operability, and gate elevation of the 30-inch overflow structure for Lake Merced. Make recommendations on future use.
- Unblock the culvert between North and South Lakes to allow less restricted movement of water between the lakes.

- Field inspect all combined sewer overflows to verify they have been disconnected. Perform dye tests when integrity is unknown.
- Field inspect stormwater runoff areas around the lake to verify discharge locations.
- Develop an Emergency Use Plan for methods of water use and watershed impacts during a fire or other emergency.
- Perform recreational usage study to assess adequacy of existing trash and restroom facilities. Make recommendations for increased maintenance, waste disposal, or heightened security, if needed.

Appendix A

Appendix A
References

Appendix A
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Appendix

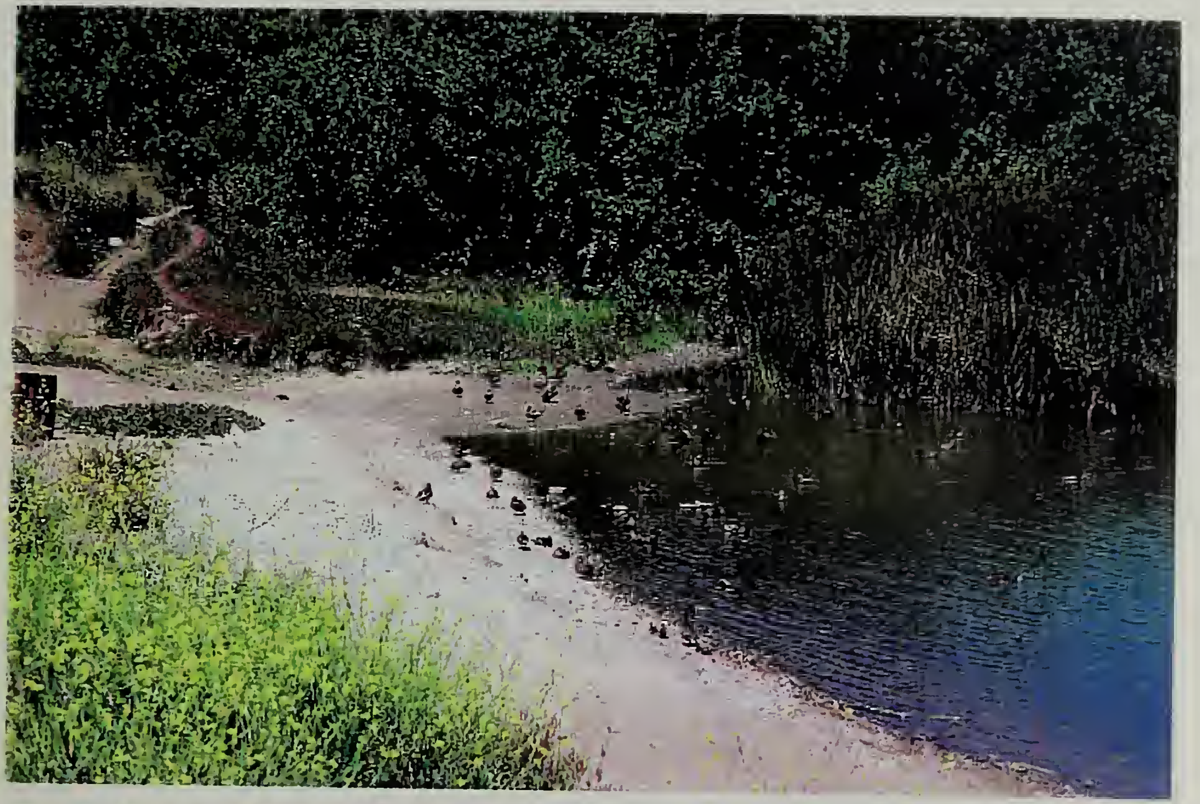
B

Appendix B
Photographs

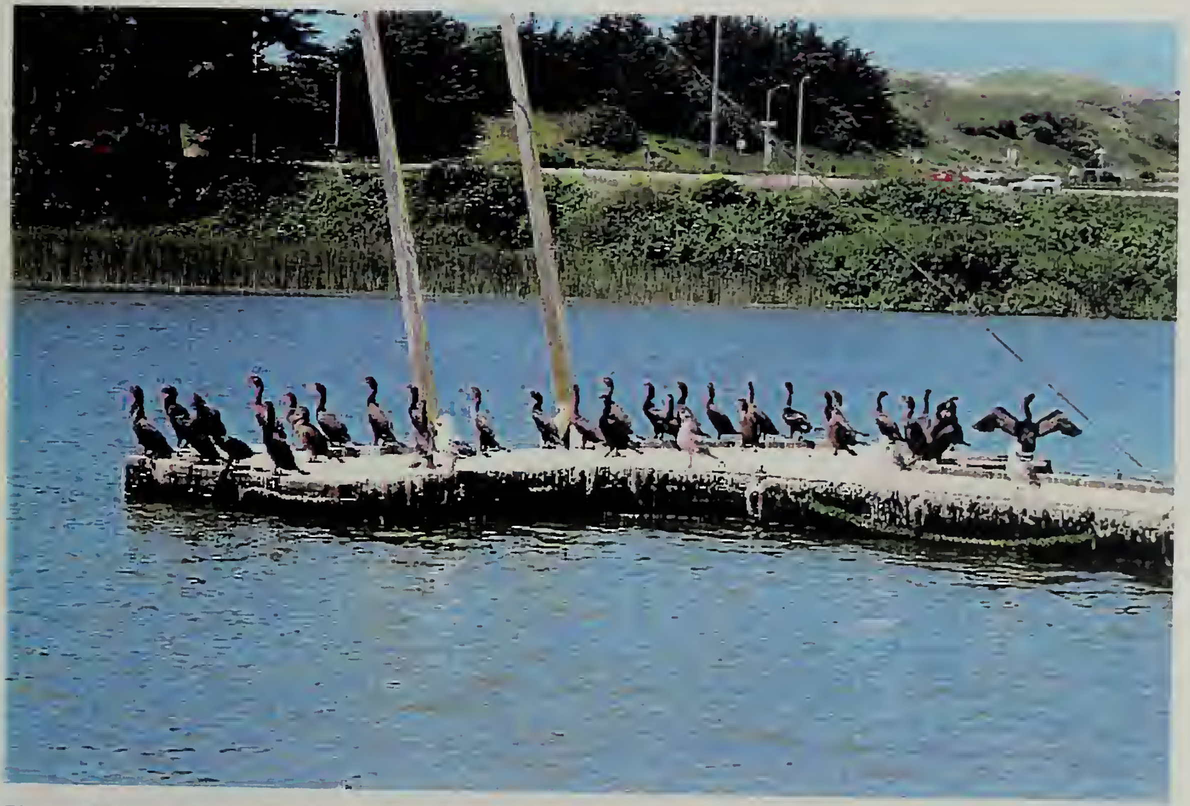
Appendix B
Photographs

Photograph 1: North Lake, facing west.

Photograph 2: South Lake, facing south.



Photograph 3: Ducks along the southern shore of South Lake.



Photograph 4: Cormorants on the boat docks on the north shore of South Lake.

Photograph 5: Bicyclists along John Muir Drive.

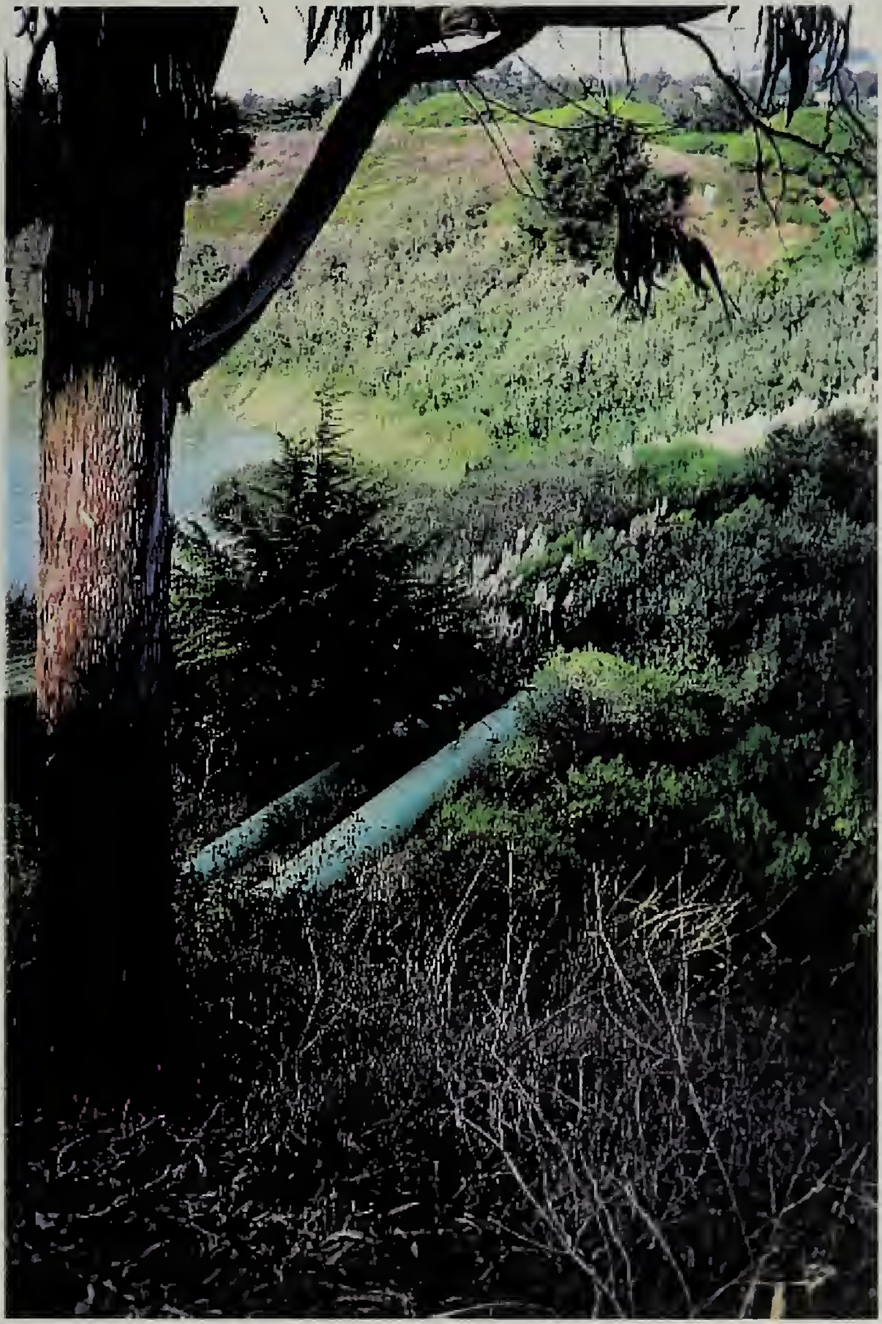
Photograph 6: Picnic area along Harding Park Road.

Photograph 7: Fishermen at the south shore of North Lake along Harding Park Road

Photograph 8: Harding Park Municipal Golf Courses.

Photograph 9: The upper fields at the Pacific Rod and Gun Club on John Muir Drive.

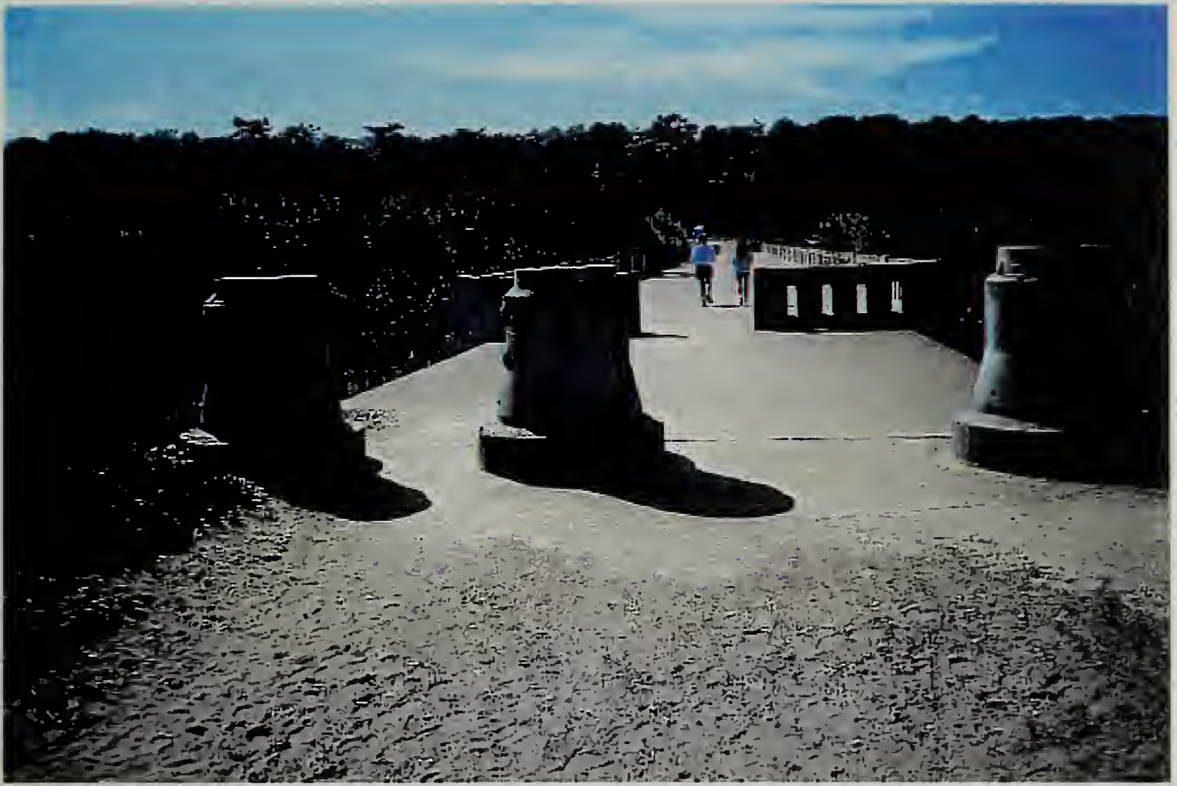
Photograph 10: Inside the Lake Merced Pump Station.



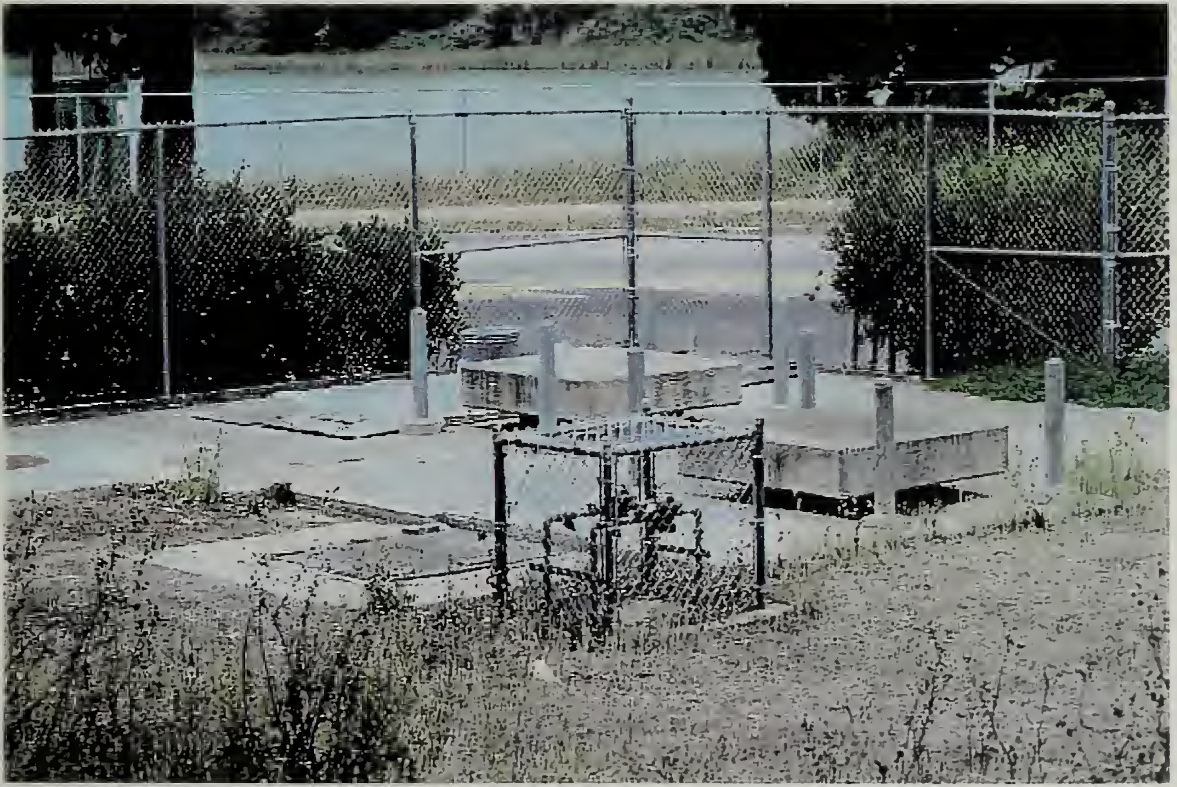
Photograph 11: The Sunset Supply Line aboveground just east of North Lake.

Photograph 12: Irrigation supply tap off of Sunset Supply Line for Harding Park Municipal Golf Courses.

Photograph 13: Vista Grande Channel paralleling John Muir Drive.

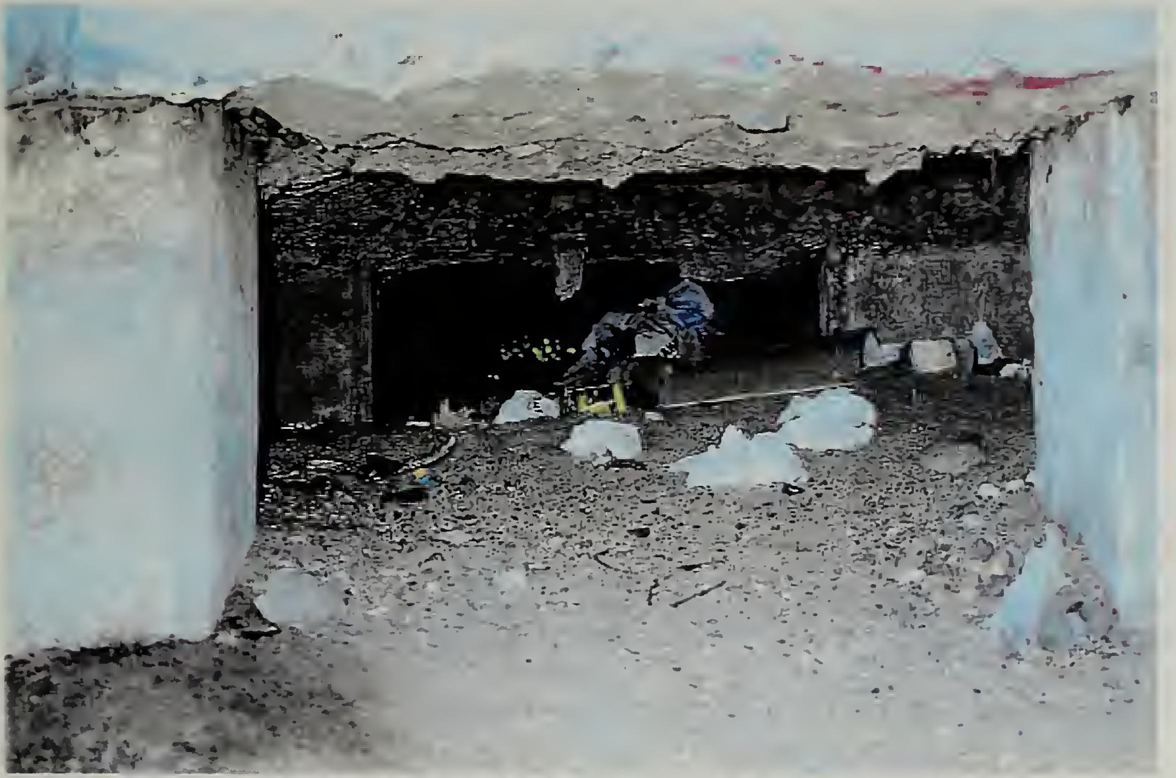


Photograph 14: Manholes at the east end of the viaduct, allowing access to the three compartment sewer housed in the viaduct.



Photograph 15: Lake Merced Control Structure along John Muir Drive.

Photograph 16: Northeast area of Olympic Country Club which occasionally floods from Vista Grande Channel during heavy rain.



Photograph 17: Debris under the viaduct separating South Lake and Impound Lake.

Photograph 18: Litter at the picnic area along Harding Park Road.

Photograph 19: Trash receptacles next to The Boathouse Restaurant.

Photograph 20: One of the two underground CDS stormwater treatment units along John Muir Drive.

Photograph 21: The underground CSF StormFilter stormwater treatment unit is located at the parking lot on Harding Park Road across from the Lake Merced Fishing and Boating Company.

Appendix C

Appendix C
Contacts

Appendix C
Contacts

Organization	***Name***
CH2M HILL	Toni Pezzetti, Hydrogeologist
Citizen	Carmen Ramirez
City of Daly City Engineering	Mohinder Sharma, City Engineer
Lake Merced Boating and Fishing Company	Don Black, Employee
Lake Merced Pump Station	Rich Yee, Supervisor
Olympic Country Club	John Fleming, Head of Grounds Maintenance
Pacific Rod and Gun	Woodrow Hervé, Former President
San Francisco Department of Public Health, Local Oversight Program	Albert Lee Cherie D'Andrea McCaulau
San Francisco Police Department Range	Mike Griffin
San Francisco Public Utilities Commission	Beth Goldstein Leah Orloff Joan Ryan Katie Miller
San Francisco Recreation and Park Department	Mike Casazza, Lake Merced Gardener James Christensen, IPM Coordinator Bob Killian, Golf Course Director Marvin Yee
San Francisco Zoo	Marla Jurosek, Capital Projects Director
Water Quality Bureau, Environmental Field Services Section	Dave Dingman

Appendix D

Appendix D
Environmental Data Resources Database

Appendix D
Environmental Data Resources Database

The EDR report presents a search of environmental regulatory agency databases. These databases, updated regularly, store information on sites having environmental agency oversight for the use, storage, disposal, or release of hazardous materials and waste. This report represents the most current information available at the time this report was prepared.

The EDR-Radius Map
with GeoCheck™

Lake Merced
Lake Merced
San Francisco, CA 94105

Inquiry Number: 272905.1s

July 14, 1998

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GeoCheck Version 2.1 A1
Government Records Searched / Data Currency Tracking Addendum A18

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-97. Search distances are per ASTM standard or custom distances requested by the user.

The address of the subject property for which the search was intended is:

LAKE MERCED
SAN FRANCISCO, CA 94105

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the subject property or within the ASTM E 1527-97 search radius around the subject property for the following Databases:

NPL:	National Priority List
Delisted NPL:	NPL Deletions
RCRIS-TSD:	Resource Conservation and Recovery Information System
AWP:	AWP
Notify 65:	Notify 65
Toxic Pits:	Toxic Pits
CERCLIS:	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP:	Comprehensive Environmental Response, Compensation, and Liability Information System
CORRACTS:	Corrective Action Report
SWF/LF:	State Landfill
AST:	Aboveground Petroleum Storage Tank Facilities
RAATS:	RCRA Administrative Action Tracking System
WMUDS:	WMUDS/SWAT
RCRIS-LQG:	Resource Conservation and Recovery Information System
HMIRS:	Hazardous Materials Information Reporting System
PADS:	PCB Activity Database System
ERNS:	Emergency Response Notification System
FINDS:	Facility Index System
TRIS:	Toxic Chemical Release Inventory System
TSCA:	Toxic Substances Control Act
MLTS:	Material Licensing Tracking System
NPL Lien:	NPL Liens
CA SLIC:	CA SLIC regions.
Ca. BEP:	CA Bond Exp. Plan
ROD:	ROD
CONSENT:	Superfund (CERCLA) Consent Decrees
Ca. WDS:	CA WDS
S Bay Reg. 2:	South Bay Region 2
Coal Gas:	Former Manufactured gas (Coal Gas) Sites.

Unmapped (orphan) sites are not considered in the foregoing analysis.

Search Results:

Search results for the subject property and the search radius, are listed below:

Subject Property:

The subject property was not listed in any of the databases searched by EDR.

Surrounding Properties:

Elevations have been determined from the USGS 1 degree Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. EDR's definition of a site with an elevation equal to the subject property includes a tolerance of -10 feet. Sites with an elevation equal to or higher than the subject property have been differentiated below from sites with an elevation lower than the subject property (by more than 10 feet). Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

CAL-SITES: Formerly known as ASPIS, this database contains both known and potential hazardous substance sites. The source is the California Department of Toxic Substance Control.

A review of the Cal-Sites list, as provided by EDR, has revealed that there is 1 Cal-Sites site within approximately 1.5 Miles of the subject property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
SF POLICE DEPARTMENT - PISTOL	JOHN MUIR DRIVE / SKYLI	1/4 - 1/2SW	4	10

CHMIRS: The California Hazardous Material Incident Report System contains information on reported hazardous material incidents, i.e., accidental releases or spills. The source is the California Office of Emergency Services.

A review of the CHMIRS list, as provided by EDR, and dated 12/31/1994 has revealed that there is 1 CHMIRS site within approximately 1.5 Miles of the subject property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
Not reported	333 EUCALYPTUS	1 - 2 ENE	23	31

CORTESE: This database identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release and all solid waste disposal facilities from which there is known migration. The source is the California Environmental Protection Agency/Office of Emergency Information.

A review of the Cortese list, as provided by EDR, has revealed that there are 5 Cortese sites within approximately 1.5 Miles of the subject property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CAL STATE UNIVERSITY, S.F.	***HOLLOWAY (1600)***	***1/2 - 1 ESE***	***E21***	***28***
ARCO	***JUNIPERO SERRA BLVD (11***	***1 - 2 ESE***	***24***	***32***
WINANS PROPERTY	***TARAVAL ST (2249)***	***1 - 2 N***	***25***	***34***
DALY CITY WASTEWATER TREATMENT	***LAKE MERCED BLVD (153)***	***1 - 2 SSE***	***26***	***37***
SF CHINESE ALLIANCE CHURCH	***VICENTES ST (1150)***	***1 - 2 NE***	***27***	***40***

EXECUTIVE SUMMARY

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 10/01/1997 has revealed that there are 7 LUST sites within approximately 1 Mile of the subject property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
HARDING GOLF COURSE	99 HARDING PARK RD.	0 - 1/8 NE	A2	9
HIGUERA STREET GARAGE	19 HIGUERA ST.	1/2 - 1 ESE	D16	20
HIGUERA AVENUE GARAGE	*19 HIGUERA AVE*	*1/2 - 1 ESE*	*D17*	*21*
LAKESHORE PLAZA	*11 LAKESHORE PLZ*	*1/2 - 1 NNE*	*19*	*24*
CAL STATE UNIVERSITY, S.F.	*HOLLOWAY (1600)*	*1/2 - 1 ESE*	*E21*	*28*
CAL STATE UNIVERSITY S F	*1600 HOLLOWAY AVE*	*1/2 - 1 ESE*	*E22*	*28*

Lower Elevation	Address	Dist / Dir	Map ID	Page
FORMER UNOCAL	2710 SLOAT BLVD.	1/2 - 1 NNW	20	27

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 2 UST sites within approximately 0.75 Miles of the subject property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SAN FRANCISCO WATER DEPARTMENT	990 LAKE MERCED BL	1/2 - 1 SE	B8	12
STAR CO.	19 HIGUERA ST.	1/2 - 1 ESE	D14	19

CA FID: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the Ca. FID list, as provided by EDR, has revealed that there are 7 Ca. FID sites within approximately 0.75 Miles of the subject property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
*REC&PARK/HARDING PARK	99 HARDING PARK RD	0 - 1/8 NNE	A1	9
OLYMPIC #2	11 LAKESHORE PL	1/4 - 1/2 NNW	3	9
PARK MERCED APARTMENTS	310 ARBALLO DR	1/2 - 1 ESE	C9	16
PARK MERCED APARTMENTS	350 ARBALLO DR	1/2 - 1 ESE	C10	17
PARK MERCED APARTMENTS	345 VIDAL DR	1/2 - 1 SE	B12	18
PARK MERCED APARTMENTS	19 HIGUERA ST	1/2 - 1 ESE	D15	20

Lower Elevation	Address	Dist / Dir	Map ID	Page
CALIFORNIA NATIONAL GUARD	99 ZOO RD	1/2 - 1 NW	7	12

EXECUTIVE SUMMARY

HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency

A review of the HAZNET list, as provided by EDR, has revealed that there are 5 HAZNET sites within approximately 0.75 Miles of the subject property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
CCSF ZOOLOGICAL GARDENS	ZOO ROAD / SKYLINE BLVD	1/2 - 1 NNW	5	11
LAKESHORE ELEMENTARY	220 MIDDLEFIELD DR	1/2 - 1 NE	6	11
1X PARK MERCED	345 VIDAL DR	1/2 - 1 SE	B11	17
SFUSD LOUISE M LOMBARD ALTERNA	700 FONT BLVD	1/2 - 1 ESE	13	18

Lower Elevation	Address	Dist / Dir	Map ID	Page
OMS #36	*END OF ZOO RD (FT FUNST*	*1/2 - 1 WNW*	*18*	*24*

RCRIS: The Resource Conservation and Recovery Act database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by the Act. The source of this database is the U.S. EPA.

A review of the RCRIS-SQG list, as provided by EDR, and dated 01/01/1998 has revealed that there is 1 RCRIS-SQG site within approximately 0.75 Miles of the subject property.

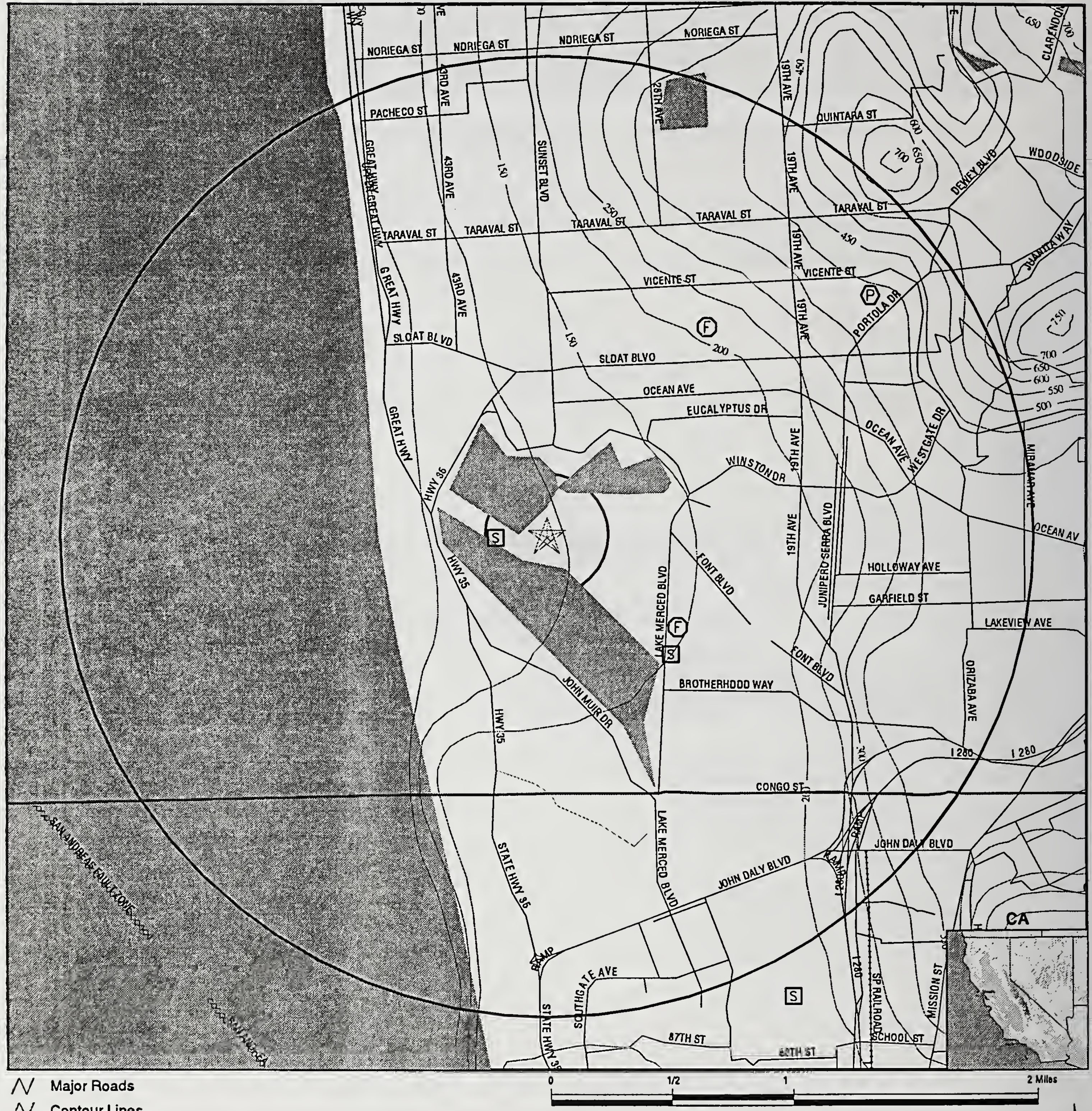
Lower Elevation	Address	Dist / Dir	Map ID	Page
OMS #36	*END OF ZOO RD (FT FUNST*	*1/2 - 1 WNW*	*18*	*24*

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
HILLS PLAZA	Cal-Sites
FIGONE COLD STORAGE CORP.	Cortese, LUST, S Bay Reg. 2
SF MUNI RAILWAY MAINTENANCE	Cortese, LUST, S Bay Reg. 2
SF RECREATION(GOLF COURSE)	Cortese, LUST, S Bay Reg. 2
BODEMIX	SWF/LF, WMUDS
FLORA CRANE	SWF/LF
LOFTON	SWF/LF
SF NORTH LANDFILL	SWF/LF
SF SOUTH LANDFILL	SWF/LF
HUNTER'S POINT	SWF/LF
PRESIDIO TRANSFER STATION	SWF/LF
CITY COLLEGE OF SF PHELAN CAMPUS	SWF/LF
LEONETTI	SWF/LF, WMUDS
SF PIER 94	SWF/LF, WMUDS
MIRZA	SWF/LF
FORMER SERVICE STATION	LUST
ORGAN MAINT SHOP #36	UST
ORGANIZATIONAL MAINTENANCE SHO	UST
SLOAT OLYMPIC	UST
HARDING PARK	UST
PARK MERCED APARTMENTS	Ca. FID
CALTRANS	RCRIS-SQG, FINDS, HAZNET
CALTRANS	HAZNET
OMS #36	HAZNET
CHEVRON LOUISIANA (VESSEL #584696)	HAZNET
CHEVRON OREGON (VESSEL #566080)	HAZNET
CHEVRON CALIFORNIA (VESSEL #541563	HAZNET
SEARIVER LONG BEACH	HAZNET
SEARIVER BENICIA	HAZNET
SEARIVER NORTH SLOPE	HAZNET
CCSF-PUC WATER-LAKE MERCED PMP	HAZNET
1X JEFF STEWART/VESSEL #101904572	HAZNET
PRESIDIO OF SAN FRANCISCO	HAZNET
MV RJ PFEIFFER OFF NO 979814	RCRIS-SQG, FINDS, HAZNET
CCSF-POLICE ACADEMY	HAZNET
HERTZ RENT-A-CAR	HAZNET
1X LONDON VICTORY, THE VESSEL #VI	HAZNET
MV RJ PFEIFFER OFF NO 979814	HAZNET
STATE OF CALIFORNIA	HAZNET
CITY/COUNTY OF SAN FRANCISCO	HAZNET

TOPOGRAPHIC MAP - 272905.1s - Camp, Dresser & McKee, Inc.



- Major Roads
- Contour Lines
- Waterways
- Earthquake Fault Lines
- ◎ Earthquake epicenter, Richter 5 or greater
- Ⓕ Closest Federal Well in quadrant
- Ⓢ Closest State Well in quadrant
- Ⓟ Closest Public Water Supply Well
- (HD) Closest Hydrogeological Data

TARGET PROPERTY:	Lake Merced	CUSTOMER:	Camp, Dresser & McKee, Inc.
ADDRESS:	Lake Merced	CONTACT:	Andria Pomponi
CITY/STATE/ZIP:	San Francisco CA 94105	INQUIRY #:	272905.1s
LAT/LONG:	37.7238 / 122.4927	DATE:	July 14, 1998 7:00 pm

GEOCHECK VERSION 2.1
SUMMARY

TARGET PROPERTY COORDINATES

Latitude (North):	37.723839 - 37° 43' 25.8"
Longitude (West):	122.492668 - 122° 29' 33.6"
Universal Transverse Mercator:	Zone 10
UTM X (Meters):	-8408426.0
UTM Y (Meters):	18934720.0

USGS TOPOGRAPHIC MAP ASSOCIATED WITH THIS SITE

Target Property:	2437122-F4 SAN FRANCISCO SOUTH, CA

GEOLOGIC AGE IDENTIFICATION†

Geologic Code:	Q
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary

ROCK STRATIGRAPHIC UNIT†

Category:	Stratifed Sequence

GROUNDWATER FLOW INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, including well data collected on nearby properties, regional groundwater flow information (from deep aquifers), or surface topography.‡

AQUIFLOW™** Search Radius: 2.000 Miles

MAP ID	DISTANCE FROM TP	DIRECTION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported			

General Topographic Gradient at Target Property: General West
General Hydrogeologic Gradient at Target Property: No hydrogeologic data available.
Site-Specific Hydrogeological Data*:

Search Radius:	2.0 miles
Status:	Not found

FEDERAL DATABASE WELL INFORMATION

WELL QUADRANT	DISTANCE FROM TP	LITHOLOGY	DEPTH TO WATER TABLE
Northern	1 - 2 Miles	Not Reported	Not Reported
Eastern	1/2 - 1 Mile	Not Reported	Not Reported
Southern	>2 Miles	Not Reported	Not Reported

STATE DATABASE WELL INFORMATION

WELL QUADRANT	DISTANCE FROM TP
Eastern	1/2 - 1 Mile
Southern	>2 Miles
Western	1/8 - 1/4 Mile

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† Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).
‡ U.S. EPA Ground Water Handbook, Vol I: Ground Water and Contamination, Office of Research and development EPA/625/6-90/016a,Chapter 4, page 78, September 1990.
** EDR AQUIFLOW™ information System of hydrogeologically determined groundwater flow directions at specific locations. See the data pages at the end of this report for a complete description.

GEOCHECK VERSION 2.1
SUMMARY

PUBLIC WATER SUPPLY SYSTEM INFORMATION

Searched by Nearest PWS.
NOTE: PWS System location is not always the same as well location.

PWS Name:	LOG CABIN RANCH CITY & CO OF SAN FRANCISCO PESCADERO LA HONDA, CA 94062
Location Relative to TP:	1 - 2 Miles East

PWS currently has or has had major violation(s): Yes

AREA RADON INFORMATION

EPA Radon Zone for SAN FRANCISCO County: 2

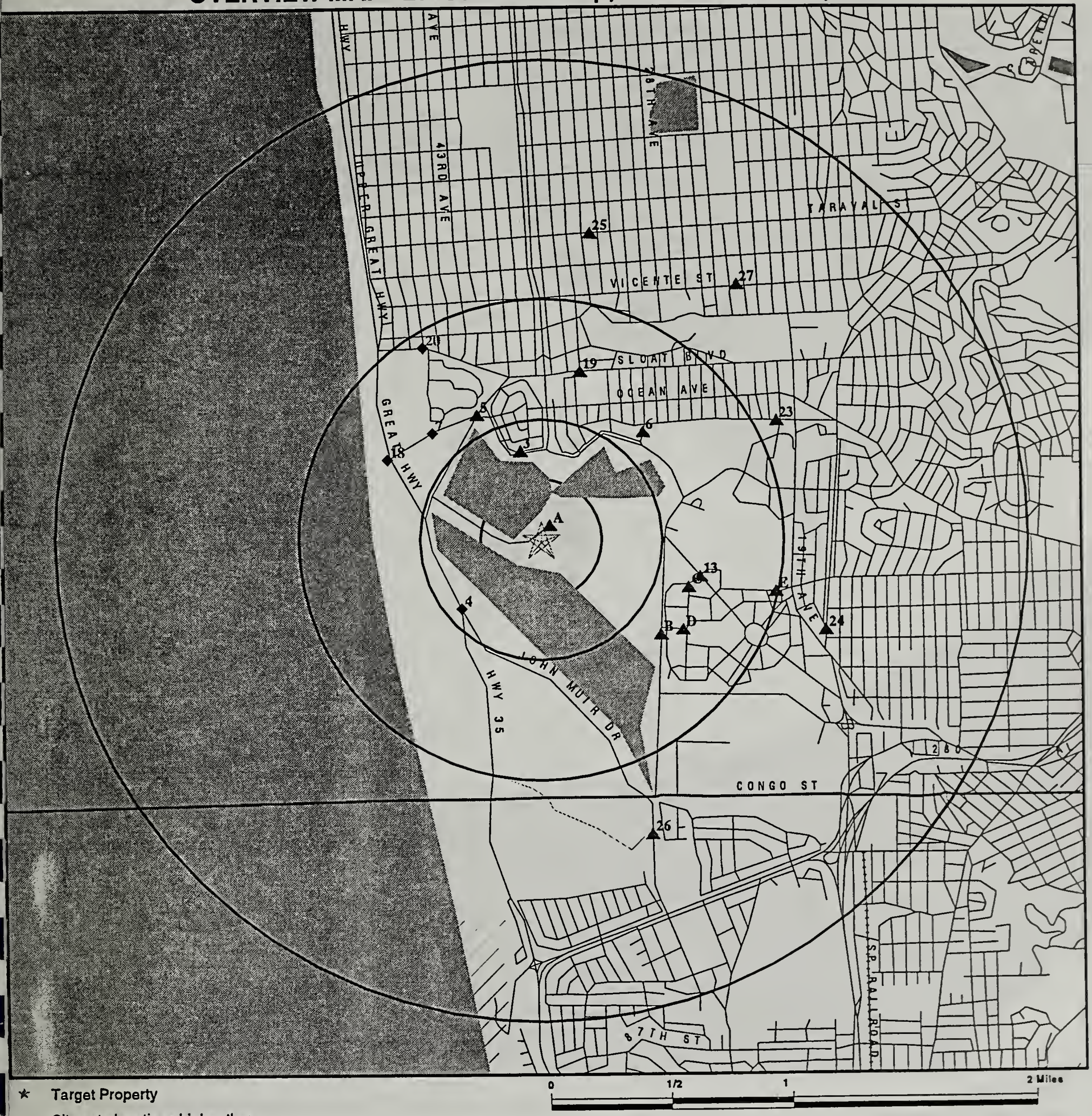
Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

SAN FRANCISCO COUNTY, CA

Number of sites tested: 14

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.636 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.500 pCi/L	100%	0%	0%
Basement	0.360 pCi/L	100%	0%	0%

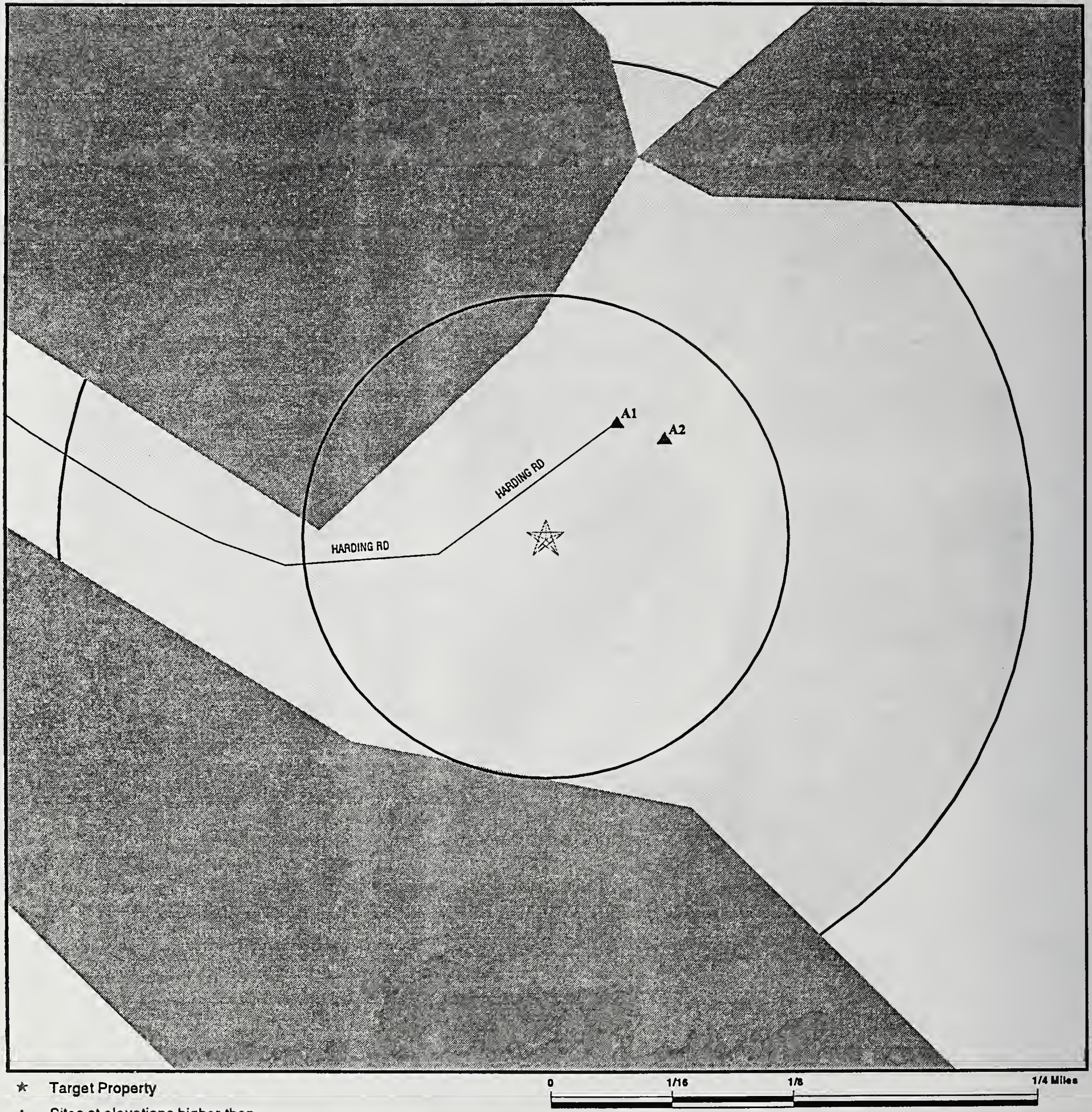
OVERVIEW MAP - 272905.1s - Camp, Dresser & McKee, Inc.



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ▲ Coal Gasification Sites (if requested)
- ▨ National Priority List Sites
- ▨ Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- ▨ 100-year flood zone
- ▨ 500-year flood zone

TARGET PROPERTY:	Lake Merced	CUSTOMER:	Camp, Dresser & McKee, Inc.
ADDRESS:	Lake Merced	CONTACT:	Andria Pomponi
CITY/STATE/ZIP:	San Francisco CA 94105	INQUIRY #:	272905.1s
LAT/LONG:	37.7238 / 122.4927	DATE:	July 14, 1998 6:57 pm

DETAIL MAP - 272905.1s - Camp, Dresser & McKee, Inc.



★ Target Property

▲ Sites at elevations higher than or equal to the target property

◆ Sites at elevations lower than the target property

Coal Gasification Sites (if requested)

Sensitive Receptors

▨ National Priority List Sites

▨ Landfill Sites

Power transmission lines

Oil & Gas pipelines

TARGET PROPERTY:	Lake Merced	CUSTOMER:	Camp, Dresser & McKee, Inc.
ADDRESS:	Lake Merced	CONTACT:	Andria Pomponi
CITY/STATE/ZIP:	San Francisco CA 94105	INQUIRY #:	272905.1s
LAT/LONG:	37.7238 / 122.4927	DATE:	July 14, 1998 6:59 pm

MAP FINDINGS SUMMARY SHOWING ALL SITES

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
NPL		1.500	0	0	0	0	0	0
Delisted NPL		TP	NR	NR	NR	NR	NR	0
RCRIS-TSD		1.000	0	0	0	0	NR	0
AWP		1.500	0	0	0	0	0	0
Cal-Sites		1.500	0	0	1	0	0	1
Notify 65		1.500	0	0	0	0	0	0
CHMIRS		1.500	0	0	0	0	1	1
Cortese		1.500	0	0	0	1	4	5
Toxic Pits		1.500	0	0	0	0	0	0
CERCLIS		1.000	0	0	0	0	NR	0
CERC-NFRAP		TP	NR	NR	NR	NR	NR	0
CORRACTS		1.500	0	0	0	0	0	0
State Landfill		1.000	0	0	0	0	NR	0
LUST		1.000	1	0	0	6	NR	7
UST		0.750	0	0	0	2	NR	2
CA FID		0.750	1	0	1	5	NR	7
AST		TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
WMUDS/SWAT		1.000	0	0	0	0	NR	0
HAZNET		0.750	0	0	0	5	NR	5
RCRIS Sm. Quan. Gen.		0.750	0	0	0	1	NR	1
RCRIS Lg. Quan. Gen.		0.750	0	0	0	0	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
CA SLIC		1.000	0	0	0	0	NR	0
CA Bond Exp. Plan		1.500	0	0	0	0	0	0
ROD		1.500	0	0	0	0	0	0
CONSENT		1.500	0	0	0	0	0	0
CA WDS		TP	NR	NR	NR	NR	NR	0
South Bay Region 2		TP	NR	NR	NR	NR	NR	0
Coal Gas		1.500	0	0	0	0	0	0

TP = Target Property

NR = Not Requested at this Search Distance

* Sites may be listed in more than one database

MAP FINDINGS SUMMARY SHOWING ONLY SITES HIGHER THAN OR THE SAME ELEVATION AS TP

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
NPL		1.500	0	0	0	0	0	0
Delisted NPL		TP	NR	NR	NR	NR	NR	0
RCRIS-TSD		1.000	0	0	0	0	NR	0
AWP		1.500	0	0	0	0	0	0
Cal-Sites		1.500	0	0	0	0	0	0
Notify 65		1.500	0	0	0	0	0	0
CHMIRS		1.500	0	0	0	0	1	1
Cortese		1.500	0	0	0	1	4	5
Toxic Pits		1.500	0	0	0	0	0	0
CERCLIS		1.000	0	0	0	0	NR	0
CERC-NFRAP		TP	NR	NR	NR	NR	NR	0
CORRACTS		1.500	0	0	0	0	0	0
State Landfill		1.000	0	0	0	0	NR	0
LUST		1.000	1	0	0	5	NR	6
UST		0.750	0	0	0	2	NR	2
CA FID		0.750	1	0	1	4	NR	6
AST		TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
WMUDS/SWAT		1.000	0	0	0	0	NR	0
HAZNET		0.750	0	0	0	4	NR	4
RCRIS Sm. Quan. Gen.		0.750	0	0	0	0	NR	0
RCRIS Lg. Quan. Gen.		0.750	0	0	0	0	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
CA SLIC		1.000	0	0	0	0	NR	0
CA Bond Exp. Plan		1.500	0	0	0	0	0	0
ROD		1.500	0	0	0	0	0	0
CONSENT		1.500	0	0	0	0	0	0
CA WDS		TP	NR	NR	NR	NR	NR	0
South Bay Region 2		TP	NR	NR	NR	NR	NR	0
Coal Gas		1.500	0	0	0	0	0	0

TP = Target Property

NR = Not Requested at this Search Distance

* Sites may be listed in more than one database

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
A1 **NNE** **< 1/8** **Higher**	***REC&PARK/HARDING PARK** **99 HARDING PARK RD** **SAN FRANCISCO, CA 94132**	**Ca. FID**	**S101592451** **N/A**

FID:

Facility ID:	38005269	Regulate ID:	Not reported
Reg By:	Active Underground Storage Tank Location		
Cortese Code:	Not reported	SIC Code:	Not reported
Status:	Active	Facility Tel:	(415) 000-0000
Mail To:	Not reported 99 HARDING PARK RD SAN FRANCISCO, CA 94132		
Contact:	Not reported	Contact Tel:	Not reported
DUNs No:	Not reported	NPDES No:	Not reported
Creation:	10/22/93	Modified:	00/00/00
EPA ID:	Not reported		
Comments:	Not reported		

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
A2 **NE** **< 1/8** **Higher**	**HARDING GOLF COURSE** **99 HARDING PARK RD.** **, CA 94132**	**LUST**	**S102532409** **N/A**

LUST San Francisco County:

Facility ID:	10773
Region:	SAN FRANCISCO
Priority:	2B
Case Type:	Undefined
Number of Tanks:	0
Cross Street:	SKYLINE BLVD.
Free Product:	No
Amount of Free Product:	Not reported
Case Manager:	AL
MTBE:	Not reported
Depth to Groundwater:	Not reported
Gradient:	Not reported
Benzine:	Not reported
Primary Substance:	Gasoline
Basin:	Not reported
Facility Contact:	CCSF
Closed Number:	0
Comments:	Not reported

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
3 **NNW** **1/4-1/2** **Higher**	**OLYMPIC #2** **11 LAKESHORE PL** **SAN FRANCISCO, CA 94132**	**Ca. FID**	**S101592507** **N/A**

OLYMPIC #2 (Continued) **S101592507**

FID:

Facility ID:	38005343	Regulate ID:	Not reported
Reg By:	Active Underground Storage Tank Location		
Cortese Code:	Not reported	SIC Code:	Not reported
Status:	Active	Facility Tel:	(415) 753-9258
Mail To:	Not reported 260 MICHELE CT SAN FRANCISCO, CA 94132		
Contact:	Not reported	Contact Tel:	Not reported
DUNs No:	Not reported	NPDES No:	Not reported
Creation:	10/22/93	Modified:	00/00/00
EPA ID:	Not reported		
Comments:	Not reported		

---

4 **SW** **1/4-1/2** **Lower**	**SF POLICE DEPARTMENT - PISTOL RANGE** **JOHN MUIR DRIVE / SKYLINE BOULEVARD** **SAN FRANCISCO, CA 94132**	**Cal-Sites**	**S100182594** **N/A**

CAL-SITES:

Facility ID 38990001
Facility Type: N/A
Status: Not reported
Status Date: 03/25/1995
Lead: Not reported
Region: 2 - BERKELEY
Branch: NC - NORTH COAST
File Name: Not reported
Status Name: REMOVAL ACTION REQUIRED-USED FOR NON-AWP SITES
Lead Agancy: N/A
NPL: Not reported
SIC: 99 NONCLASSIFIABLE ESTABLISHMENTS
Staff Member Responsible for Site: Not reported
Supervisor Responsible for Site: Not reported
Region Water Control Board: Not reported
Access: Controlled
Cortese: C
Hazardous Ranking Score: Not reported
Date Site Hazard Ranked: Not reported
Groundwater Contamination: Not reported
No. of Contamintion Sources: 0
Lat/Long: Not reported
Lat/long Method: Not reported
State Assembly District Code: Not reported
State Senate District: Not reported
Activity: SITE SCREENING
Activity Status: REMOVAL ACTION REQUIRED-USED FOR NON-AWP SITES
Background: Not reported
Alternative Name: F POLICE DEPARTMENT - PISTOL RANGE
Alternative Addr: JOHN MUIR DRIVE AND SKYLINE BOULEVARD
SAN FRANCISCO, CA 94132
Comment Date: 10/30/1990
Comment: ON CORTESE LIST
SAMPLE RESULTS THE HIGHEST TOTAL LEAD IN SOIL WAS 6000
PPM AT 0.5' BELOW THE SURFACE. THE HIGH-
EST SOLUBLE LEAD WAS 300 PPM AT 16'
DEPTH. NO LEAD WAS DETECTED IN THE
GROUNDWATER SAMPLES.

SF POLICE DEPARTMENT - PISTOL RANGE (Continued) S100182594

THE SITE IS ABOUT 0.62-ACRE. THE PRESENT PISTOL RANGE COMPLEX WAS CONSTRUCTED IN THE EARLY 1940S. THE PLANNING IS CURRENTLY UNDERWAY FOR AN EXTENSIVE RENOVATION.
SITE SCREENING DONE A TOTAL OF 14 SOIL BORINGS WERE DRILLED, & 3 GROUNDWATER MONITORING WELLS WERE INSTALLED. RECOMMEND MEDIUM PRIORITY PRELIMINARY ENDANGERMENT ASSESSMENT -- SOIL SAMPLES INDICATE SPORATIC SPOTS HAD HIGH LEVELS OF LEAD.

Map ID	Site	Database(s)	EDR ID / EPA ID
5 **NNW** **1/2-1** **Higher**	**CCSF ZOOLOGICAL GARDENS** **ZOO ROAD / SKYLINE BLVD** **SAN FRANCISCO, CA 94107**	**HAZNET**	**S100932058** **N/A**

HAZNET:

Year:	1993		
Gepaid:	CAL000034849	Tepaid:	CAD028409019
Contact:	NAKAMURA SCOTT MGR	Telephone:	(415) 554-2789
Gen County:	San Francisco	Tons:	Not reported
Tsd Name:	Not reported		
Tsd Address	Not reported Not reported Not reported		
Tsd County	Los Angeles		
Mailing Address:	101 GROVE STREET ROOM 207 Not reported SAN FRANCISCO, CA 94102		
Category:	Unspecified organic liquid mixture		
Disposal Method:	Transfer station		

Year:	Not reported		
Gepaid:	CAL000034849	Tepaid:	CAD028409019
Contact:	Not reported	Telephone:	Not reported
Gen County:	Not reported	Tons:	16
Tsd Name:	CROSBY & OVERTON - PLANT #1		
Tsd Address	1610 W 16TH ST Not reported LONG BEACH		
Tsd County	Los Angeles		
Mailing Address:	Not reported Not reported Not reported		
Category:	Unspecified organic liquid mixture		
Disposal Method:	Transfer station		

Map ID	Site	Database(s)	EDR ID / EPA ID
6 **NE** **1/2-1** **Higher**	**LAKESHORE ELEMENTARY** **220 MIDDLEFIELD DR** **SAN FRANCISCO, CA 94132**	**HAZNET**	**S100866267** **N/A**

LAKESHORE ELEMENTARY (Continued) **S100866267**

HAZNET:

Year:	1993		
Gepaid:	CAL912623836	Tepaid:	CAL000027741
Contact:	JENSEN, NIKKI	Telephone:	(415) 695-5947
Gen County:	San Francisco	Tons:	4
Tsd Name:	Not reported		
Tsd Address	Not reported Not reported Not reported		
Tsd County	Calaveras		
Mailing Address:	1551 NEWCOMB AVE, ROOM 103 Not reported SAN FRANCISCO, CA 94124		
Category:	Asbestos containing waste		
Disposal Method:	Not reported		

Year:	Not reported		
Gepaid:	CAL912623836	Tepaid:	CAL000027741
Contact:	Not reported	Telephone:	Not reported
Gen County:	Not reported	Tons:	5981
Tsd Name:	CALIFORNIA ASBESTOS MONOFILL		
Tsd Address	O'BYRNES FERRY RD Not reported COPPEROPOLIS		
Tsd County	Calaveras		
Mailing Address:	Not reported Not reported Not reported		
Category:	Asbestos containing waste		
Disposal Method:	Disposal, landfill		

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7 NW 1/2-1 Lower	**CALIFORNIA NATIONAL GUARD** **99 ZOO RD** **SAN FRANCISCO, CA 94116**	**Ca. FID**	**S101592464** **N/A**

FID:

Facility ID:	38005287	Regulate ID:	Not reported
Reg By:	Active Underground Storage Tank Location		
Cortese Code:	Not reported	SIC Code:	Not reported
Status:	Active	Facility Tel:	(415) 000-0000
Mail To:	Not reported 99 ZOO RD SAN FRANCISCO, CA 94116		
Contact:	Not reported	Contact Tel:	Not reported
DUNs No:	Not reported	NPDES No:	Not reported
Creation:	10/22/93	Modified:	00/00/00
EPA ID:	Not reported		
Comments:	Not reported		

B8 SE 1/2-1 Higher	**SAN FRANCISCO WATER DEPARTMENT** **990 LAKE MERCED BL** **SAN FRANCISCO, CA 94124**	**UST**	**U003111700** **N/A**

SAN FRANCISCO WATER DEPARTMENT (Continued) U003111700

UST San Francisco County:

Facility ID: 9686
Tank ID: 009686001001
Manufacturer: Modem Welding
Total Tanks: Not reported
Tank Capacity: 12000
Date Installed: 1/1/86 0:00:00
Case Number: Not reported
Leak Detection: Interstitial
Contents A: Motor Vehicle Fuel
Contents B: Product
Contents C: Diesel
DBA: CCSF/PUC/WATER/LAKE MERCED PUMP ST
Care of Address: Not reported
Mailing Address: 1990 Newcomb Avenue
Other Substance: Not reported
Tank Construction Type: Double Wall
Tank Material: Fiberglass
Interior Lining: Unknown
Corrosion Protection: Coating
Spill Contamination Installed Date: Not reported
Overfill Prevention Installed Date: Not reported
Piping Type: Suction
Piping Aboveground: No
Piping Underground: Yes
Piping Construction: Single Wall
Piping Construction Aboveground: No
Piping Construction Underground: Yes
Piping Material: Fiberglass Pipe
Piping Material Aboveground: No
Piping Material Underground: Yes
Pipe Leak Detection: Line Tightness Testing
Estimated Last Date Used: Not reported
Estimated Quantity Remaining: Not reported
Inert Filing: No
Jurisdication: 000
Other Tank System: Not reported
Other Tank Material: Not reported
Other Tank Leak Detection: 7
Other Pipe Material: Not reported
Other Pipe Leak Detection: Not reported
Methanol Compatible: No

SAN FRANCISCO WATER DEPARTMENT (Continued) **U003111700**

Facility ID:	9686	Total Tanks:	Not reported
Tank ID:	009686001002	Tank Capacity:	12000
Manufacturer:	Modern Welding	Date Installed:	1/1/86 0:00:00
Case Number:	Not reported		
Leak Detection:	Interstitial		
Contents A:	Motor Vehicle Fuel		
Contents B:	Product		
Contents C:	Diesel		
DBA:	CCSF/PUC/WATER/LAKE MERCED PUMP ST		
Care of Address:	Not reported		
Mailing Address:	1990 Newcomb Avenue		
Other Substance:	Not reported		

Tank Construction Type:	Double Wall
Tank Material:	Fiberglass
Interior Lining:	Unknown
Corrosion Protection:	Coating
Spill Contamination Installed Date:	Not reported
Overfill Prevention Installed Date:	Not reported
Piping Type:	Suction
Piping Aboveground:	No
Piping Underground:	Yes
Piping Construction:	Single Wall
Piping Construction Aboveground:	No
Piping Construction Underground:	Yes
Piping Material:	Fiberglass Pipe
Piping Material Aboveground:	No
Piping Material Underground:	Yes
Pipe Leak Detection:	Line Tightness Testing
Estimated Last Date Used:	1/1/95 0:0
Estimated Quantity Remaining:	9700
Inert Filing:	No
Jurisdication:	000
Other Tank System:	Not reported
Other Tank Material:	Not reported
Other Tank Leak Detection:	7
Other Pipe Material:	Not reported
Other Pipe Leak Detection:	Not reported
Methanol Compatible:	No

SAN FRANCISCO WATER DEPARTMENT (Continued) **U003111700**

Facility ID: 9686
Tank ID: 009686001003
Manufacturer: Modern Welding
Case Number: Not reported
Leak Detection: Interstitial
Contents A: Oil
Contents B: Product
Contents C: Other
DBA: CCSF/PUC/WATER/LAKE MERCED PUMP ST
Care of Address: Not reported
Mailing Address: 1990 Newcomb Avenue
Other Substance: Lube Oil-Diesel
Tank Construction Type: Double Wall
Tank Material: Fiberglass
Interior Lining: Unknown
Corrosion Protection: Coating
Spill Contamination Installed Date: Not reported
Overfill Prevention Installed Date: Not reported
Piping Type: Suction
Piping Aboveground: No
Piping Underground: Yes
Piping Construction: Single Wall
Piping Construction Aboveground: No
Piping Construction Underground: Yes
Piping Material: Fiberglass Pipe
Piping Material Aboveground: No
Piping Material Underground: Yes
Pipe Leak Detection: Line Tightness Testing
Estimated Last Date Used: Not reported
Estimated Quantity Remaining: 200
Inert Filing: No
Jurisdication: 000
Other Tank System: Not reported
Other Tank Material: Not reported
Other Tank Leak Detection: 7
Other Pipe Material: Not reported
Other Pipe Leak Detection: Not reported
Methanol Compatible: No

Total Tanks: Not reported
Tank Capacity: 550
Date Installed: Not reported

SAN FRANCISCO WATER DEPARTMENT (Continued) **U003111700**

Facility ID: 9686
Tank ID: 009686001004
Manufacturer: Modern Welding
Total Tanks: Not reported
Tank Capacity: 550
Date Installed: 1/1/86 0:00:00
Case Number: Not reported
Leak Detection: Interstitial
Contents A: Oil
Contents B: Waste
Contents C: Other
DBA: CCSF/PUC/WATER/LAKE MERCED PUMP ST
Care of Address: Not reported
Mailing Address: 1990 Newcomb Avenue
Other Substance: Motor Oil Waste
Tank Construction Type: Double Wall
Tank Material: Fiberglass
Interior Lining: Unknown
Corrosion Protection: Coating
Spill Contamination Installed Date: Not reported
Overfill Prevention Installed Date: Not reported
Piping Type: Gravity
Piping Aboveground: No
Piping Underground: Yes
Piping Construction: Single Wall
Piping Construction Aboveground: No
Piping Construction Underground: Yes
Piping Material: Fiberglass Pipe
Piping Material Aboveground: No
Piping Material Underground: Yes
Pipe Leak Detection: Line Tightness Testing
Estimated Last Date Used: 1/1/95 0:0
Estimated Quantity Remaining: 100
Inert Filing: No
Jurisdication: 000
Other Tank System: Not reported
Other Tank Material: Not reported
Other Tank Leak Detection: 7
Other Pipe Material: Not reported
Other Pipe Leak Detection: Not reported
Methanol Compatible: No

C9
ESE
1/2-1
Higher

PARK MERCED APARTMENTS
310 ARBALLO DR
SAN FRANCISCO, CA 94132

Ca. FID

S101592434
N/A

PARK MERCED APARTMENTS (Continued) **S101592434**

FID:

Facility ID:	38005245	Regulate ID:	Not reported
Reg By:	Active Underground Storage Tank Location		
Cortese Code:	Not reported	SIC Code:	Not reported
Status:	Active	Facility Tel:	(415) 000-0000
Mail To:	Not reported 310 ARBALLO DR SAN FRANCISCO, CA 94132		
Contact:	Not reported	Contact Tel:	Not reported
DUNs No:	Not reported	NPDES No:	Not reported
Creation:	10/22/93	Modified:	00/00/00
EPA ID:	Not reported		
Comments:	Not reported		

C10 **ESE** **1/2-1** **Higher**	**PARK MERCED APARTMENTS** **350 ARBALLO DR** **SAN FRANCISCO, CA 94132**	**Ca. FID**	**S101592550** **N/A**

FID:

Facility ID:	38005408	Regulate ID:	Not reported
Reg By:	Active Underground Storage Tank Location		
Cortese Code:	Not reported	SIC Code:	Not reported
Status:	Active	Facility Tel:	(415) 000-0000
Mail To:	Not reported 350 ARBALLO DR SAN FRANCISCO, CA 94132		
Contact:	Not reported	Contact Tel:	Not reported
DUNs No:	Not reported	NPDES No:	Not reported
Creation:	10/22/93	Modified:	00/00/00
EPA ID:	Not reported		
Comments:	Not reported		

B11 **SE** **1/2-1** **Higher**	**1X PARK MERCED** **345 VIDAL DR** **SAN FRANCISCO, CA 94132**	**HAZNET**	**S100927603** **N/A**

HAZNET:

Year:	1993		
Gepaid:	CAC000784872	Tepaid:	NCD000648451
Contact:	Not reported	Telephone:	(000) 000-0000
Gen County:	San Francisco	Tons:	Not reported
Tsd Name:	Not reported		
Tsd Address	Not reported Not reported Not reported		
Tsd County	Unknown		
Mailing Address:	3711 19TH AVE Not reported SAN FRANCISCO, CA 94132		
Category:	Aqueous solution with total organic residues less than 10 percent		
Disposal Method:	Not reported		

1X PARK MERCED (Continued) **S100927603**

Year:	Not reported		
Gepaid:	CAC000784872	Tepaid:	NCD000648451
Contact:	Not reported	Telephone:	Not reported
Gen County:	Not reported	Tons:	22
Tsd Name:	UNKNOWN		
Tsd Address	Not reported Not reported Not reported		
Tsd County	Unknown		
Mailing Address:	Not reported Not reported Not reported		
Category:	Aqueous solution with total organic residues less than 10 percent		
Disposal Method:	Not specified		

B12
SE
1/2-1
Higher

PARK MERCED APARTMENTS **Ca. FID** **S101592302**
345 VIDAL DR **N/A**
SAN FRANCISCO, CA 94132

FID:

Facility ID:	38002496	Regulate ID:	Not reported
Reg By:	Active Underground Storage Tank Location		
Cortese Code:	Not reported	SIC Code:	Not reported
Status:	Active	Facility Tel:	(415) 000-0000
Mail To:	Not reported 345 VIDAL DR SAN FRANCISCO, CA 94132		
Contact:	Not reported	Contact Tel:	Not reported
DUNs No:	Not reported	NPDES No:	Not reported
Creation:	10/22/93	Modified:	00/00/00
EPA ID:	Not reported		
Comments:	Not reported		

13
ESE
1/2-1
Higher

SFUSD LOUISE M LOMBARD ALTERNATIVE HIGH **HAZNET** **S100873966**
700 FONT BLVD **N/A**
SAN FRANCISCO, CA 94132

HAZNET:

Year:	1995		
Gepaid:	CAD982337438	Tepaid:	CAL000027741
Contact:	ZEFF DAVID STAFF	Telephone:	(415) 565-9567
Gen County:	San Francisco	Tons:	Not reported
Tsd Name:	Not reported		
Tsd Address	Not reported Not reported Not reported		
Tsd County	Calaveras		
Mailing Address:	135 VAN NESS AVE RM 217 Not reported SAN FRANCISCO, CA 94102		
Category:	Asbestos containing waste		
Disposal Method:	Disposal, landfill		

SFUSD LOUISE M LOMBARD ALTERNATIVE HIGH (Continued) S100873966

Year:	1993		
Gepaid:	CAD982337529	Tepaid:	CAL000027741
Contact:	ZEFF DAVID STAFF	Telephone:	(415) 565-9567
Gen County:	San Francisco	Tons:	2
Tsd Name:	Not reported		
Tsd Address	Not reported Not reported Not reported		
Tsd County	Calaveras		
Mailing Address:	1551 NEWCOMB AVENUE RM. 115 Not reported SAN FRANCISCO, CA 94124 - 2316		
Category:	Asbestos containing waste		
Disposal Method:	Not reported		

Year:	Not reported		
Gepaid:	CAD982337529	Tepaid:	CAL000027741
Contact:	Not reported	Telephone:	Not reported
Gen County:	Not reported	Tons:	1432
Tsd Name:	CALIFORNIA ASBESTOS MONOFILL		
Tsd Address	O'BYRNES FERRY RD Not reported COPPEROPOLIS		
Tsd County	Calaveras		
Mailing Address:	Not reported Not reported Not reported		
Category:	Asbestos containing waste		
Disposal Method:	Disposal, landfill		

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
D14 **ESE** **1/2-1** **Higher**	**STAR CO.** **19 HIGUERA ST.** **SAN FRANCISCO, CA 94132**	UST	U001595776 N/A

State UST:

Facility ID:	40359		
Tank Num:	1	Container Num:	1
Tank Capacity:	2000	Year Installed:	Not reported
Tank Used for:	PRODUCT		
Type of Fuel:	UNLEADED	Tank Constrctn:	Not reported
Leak Detection:	None		
Contact Name:	JOAN GIL	Telephone:	(415) 585-5910
Total Tanks:	5	Region:	Not reported
Facility Type:	2	Other Type:	CAR RENTAL

Facility ID:	40359		
Tank Num:	2	Container Num:	2
Tank Capacity:	2000	Year Installed:	Not reported
Tank Used for:	PRODUCT		
Type of Fuel:	UNLEADED	Tank Constrctn:	Not reported
Leak Detection:	None		
Contact Name:	JOAN GIL	Telephone:	(415) 585-5910
Total Tanks:	5	Region:	Not reported
Facility Type:	2	Other Type:	CAR RENTAL

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

STAR CO. (Continued) **U001595776**

Facility ID:	40359		
Tank Num:	3	Container Num:	3
Tank Capacity:	2000	Year Installed:	Not reported
Tank Used for:	PRODUCT		
Type of Fuel:	PREMIUM	Tank Constrctn:	Not reported
Leak Detection:	None		
Contact Name:	JOAN GIL	Telephone:	(415) 585-5910
Total Tanks:	5	Region:	Not reported
Facility Type:	2	Other Type:	CAR RENTAL

Facility ID:	40359		
Tank Num:	4	Container Num:	4
Tank Capacity:	2000	Year Installed:	Not reported
Tank Used for:	PRODUCT		
Type of Fuel:	UNLEADED	Tank Constrctn:	Not reported
Leak Detection:	None		
Contact Name:	JOAN GIL	Telephone:	(415) 585-5910
Total Tanks:	5	Region:	Not reported
Facility Type:	2	Other Type:	CAR RENTAL

Facility ID:	40359		
Tank Num:	5	Container Num:	5
Tank Capacity:	2000	Year Installed:	Not reported
Tank Used for:	PRODUCT		
Type of Fuel:	UNLEADED	Tank Constrctn:	Not reported
Leak Detection:	None		
Contact Name:	JOAN GIL	Telephone:	(415) 585-5910
Total Tanks:	5	Region:	Not reported
Facility Type:	2	Other Type:	CAR RENTAL

D15 **ESE** **1/2-1** **Higher**	**PARK MERCED APARTMENTS** **19 HIGUERA ST** **SAN FRANCISCO, CA 94132**	**Ca. FID**	**S101591975** **N/A**

FID:

Facility ID:	38000275	Regulate ID:	Not reported
Reg By:	Active Underground Storage Tank Location		
Cortese Code:	Not reported	SIC Code:	Not reported
Status:	Active	Facility Tel:	(415) 000-0000
Mail To:	Not reported 19 HIGUERA ST SAN FRANCISCO, CA 94132		
Contact:	Not reported	Contact Tel:	Not reported
DUNs No:	Not reported	NPDES No:	Not reported
Creation:	10/22/93	Modified:	00/00/00
EPA ID:	Not reported		
Comments:	Not reported		

D16 **ESE** **1/2-1** **Higher**	**HIGUERA STREET GARAGE** **19 HIGUERA ST.** **, CA 94132**	**LUST**	**S102431377** **N/A**

HIGUERA STREET GARAGE (Continued) **S102431377**

LUST San Francisco County:

Facility ID:	10154
Region:	SAN FRANCISCO
Priority:	1B
Case Type:	GW
Number of Tanks:	0
Cross Street:	VIDAL STREET
Free Product:	No
Amount of Free Product:	Not reported
Case Manager:	AL
MTBE:	Not reported
Depth to Groundwater:	Not reported
Gradient:	Not reported
Benzine:	Not reported
Primary Substance:	Not reported
Basin:	Not reported
Facility Contact:	Not reported
Closed Number:	1
Comments:	Not reported

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
D17 **ESE** **1/2-1** **Higher**	**HIGUERA AVENUE GARAGE** **19 HIGUERA AVE** **SAN FRANCISCO, CA 94132**	**LUST** **S Bay Reg. 2**	**S102431376** **N/A**

State LUST:

Facility Type	INACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Gasoline		
Lead Agency:	Local Agency		
Case Type:	Other ground water affected		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	Excavate and Dispose - remove contaminated soil and dispose in approved site		
Review Date:	10/10/1922	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	11/16/1995
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	10/10/1996	Release Date:	03/21/1989

Facility Type	INACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Gasoline		
Lead Agency:	Local Agency		
Case Type:	Other ground water affected		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	Excavate and Dispose - remove contaminated soil and dispose in approved site		
Review Date:	10/10/1922	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	11/16/1995
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	10/10/1996	Release Date:	03/21/1989

LUST Region 2:

Facility ID:	38-0232	Lat/Long:	37.7183280 / -122.4822110
Region:	2	Record Number:	4817
Entered Date:	04/26/1989	Last Review:	10/10/1922
Correspondence:	09/02/1996	Release Date:	03/21/1989

HIGUERA AVENUE GARAGE (Continued) **S102431376**

Case Number: 10154
How Discovered: Tank Closure
How Stopped: Tank Closure
Leak Source: Tank
Facility Status: Not reported
Update Status: File archived
Review Status: Not reported
Priority: Not reported
Local Agency: 38000
Case Type: Other ground water or surface water is affected or threatened
Staff Initial: VP
Discovered Date: 03/21/1989
Stopped Date: 03/21/1989
Leak Cause: Structure Failure
Primary Substance: Gasoline
Secondary Substance: Waste Oil
Maximum Soil Concentration: 6230
Maximum Groundwater Impact: 7
Current Benzene in Groundwater: 0
Maximum Benzene Concentration: 2
Nuber of Wells: 3
Depth to Groundwater: 83
MTBE Contamination Level: 0
Interim Remediation: Yes
Interim Remediation Date: 01/19/1989
Lead Agency: Local Agency
Case List: FUEL
Enforcement Type: 0
Enforcement Date: 00/00/0000
Responsible Party Search: Solvent - Identified and financially capable of performing work.
Funding: Federal
Date Status Was First Assigned - The following dates are assigned as the status progresses:
  Leak Confirmed: 00/00/0000
  Workplan Submitted: 00/00/0000
  Assessment Underway: 00/00/0000
  Pollution Characterization: 00/00/0000
  Corrective Action Plan: 11/16/1995
  Enforcement Action Date: Not reported
  Remediation Underway: 00/00/0000
  Monitoring Begun: 00/00/0000
  Case Closed: 10/10/1996
Abatement: Excavate and Dispose (landfill) of soil
Comments: ARCHIVED 9/12/96 CONTROL NO 120-098 098

South Bay Region 2:
Facility ID: 38-0232
Case Number: Not reported
Last Update: Not reported
RWQCB Initials: Not reported
DOHS Initials: Not reported
Staff: Not reported
File Number: Not reported
Case Type: Not reported
EPA Contact: Not reported
Map Number: Not reported
Type: Other ground water or surface water is affected or threatened
Lead: Local Agency (Santa Clara Valley Water District
Facility Status: Not reported
Discovered Date: Not reported
Facility Description: Not reported
Phase of Work by Responsible Party: 9
National Priority List: NOT REPORTED
Primary Substance Spilled: Gasoline
Secondary Substance Spilled: Waste Oil
Problem Caused by UST: No
Contaminant Concentration Type (1): Not reported
Key Contaminant Concentration (1): Not reported

HIGUERA AVENUE GARAGE (Continued) S102431376

Initial Maximum Concentration (1): Not reported
Current Maximum Concentration (1): Not reported
Contaminant Concentration Type (2): Not reported
Key Contaminant Concentration (2): Not reported
Initial Maximum Concentration (2): Not reported
Current Maximum Concentration (2): Not reported
Contaminant Concentration Type (3): Not reported
Key Contaminant Concentration (3): Not reported
Initial Maximum Concentration (3): Not reported
Plume in Length (FT): Not reported
Size Depth (FT): Not reported
Municipal Drinking Wells Affected: Not reported
Private Drinking Wells Affected: Not reported
Current Maximum Concentration (3): Not reported
Historical Minimum Depth to Groundwater: 83 (Feet)
Maximum Soil Concentration of Contaminates: 6230 (parts per million)
Max Grndwater Concentration of Contaminates: 7 (parts per billion)
Benzene: 0
Maximum Benzene: 2
Soil Action Needed: Not reported
Total of Extraction Flow Rate: Not reported
Estimated % of Contaminants Contained: Not reported
Contaminant Source: Not reported
Contaminant Concentration as of: Not reported
Contaminant Concentration (1): Not reported
Well or Boring Number (1): Not reported
Initial Level Concentration (1): Not reported
Current Level Concentration (1): Not reported
Contaminant Concentration (2): Not reported
Well or Boring Number (2): Not reported
Initial Level Concentration (2): Not reported
Current Level Concentration (2): Not reported
Contaminant Concentration (3): Not reported
Well or Boring Number (3): Not reported
Initial Level Concentration (3): Not reported
Current Level Concentration (3): Not reported
Number of Municipal Wells: Not reported
Number of Private Wells: Not reported
Closure Name: Not reported
Closure Date: Not reported
Soil Action Needed Start Date: Not reported
Soil Action Needed End Date: Not reported
Onsite Water Action Needed: Not reported
Onsite Water Action Needed Start Date: Not reported
Onsite Water Action Needed End Date: Not reported
Off Site Water Action Needed: Not reported
Off Site Water Action Needed Start Date: Not reported
Off Site Water Action Needed End Date: Not reported
Estimated % of Contamination Concentration: Not reported
Enforcement & Regulatory Action (1): Not reported
Enforcement Action Date (1): Not reported
Enforcement & Regulatory Action (2): Not reported
Enforcement Action Date (2): Not reported
Enforcement & Regulatory Action (3): Not reported
Enforcement Action Date (3): Not reported
Enforcement & Regulatory Action (4): Not reported
Enforcement Action Date (4): Not reported

HIGUERA AVENUE GARAGE (Continued) **S102431376**

Enforcement & Regulatory Action (5):	Not reported
Enforcement Action Date (5):	Not reported
Enforcement & Regulatory Action (6):	Not reported
Enforcement Action Date (6):	Not reported
Enforcement & Regulatory Action (7):	Not reported
Enforcement Action Date (7):	Not reported
Enforcement & Regulatory Action (8):	Not reported
Enforcement Action Date (8):	Not reported
Enforcement & Regulatory Action (9):	Not reported
Enforcement Action Date (9):	Not reported
Enforcement & Regulatory Action (10):	Not reported
Enforcement Action Date (10):	Not reported
Immediate Response Actions:	NOT REPORTED
Remediation:	Not reported
Characterization	Not reported
Comments	Not reported

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18 WNW 1/2-1 Lower	**OMS #36** **END OF ZOO RD (FT FUNSTEN)** **SAN FRANCISCO, CA 94132**	**RCRIS-SQG** **FINDS** **HAZNET**	**1000100278** **CAD981369374**

RCRIS:

Owner:	CALIFORNIA ARMY NATL GUARD (415) 555-1212
Contact:	ENVIRONMENTAL MANAGER (916) 920-6505
Record Date:	01/23/86
Classification:	Small Quantity Generator
Used Oil Recyc:	No
Violation Status:	No violations found

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19 NNE 1/2-1 Higher	**LAKESHORE PLAZA** **11 LAKESHORE PLZ** **SAN FRANCISCO, CA 94132**	**LUST** **S Bay Reg. 2**	**S102432472** **N/A**

State LUST:

Facility Type	INACTIVE	Cross Street:	SLOAT BLVD
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Gasoline		
Lead Agency:	Local Agency		
Case Type:	Other ground water affected		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	Excavate and Treat - remove contaminated soil and treat (includes spreading or land farming)		
Review Date:	03/02/1994	Confirm Leak:	10/05/1989
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	09/30/1989	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	08/15/1993	Release Date:	09/18/1989

LAKESHORE PLAZA (Continued) **S102432472**

Facility Type	INACTIVE	Cross Street:	SLOAT BLVD
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Gasoline		
Lead Agency:	Local Agency		
Case Type:	Other ground water affected		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	Excavate and Treat - remove contaminated soil and treat (includes spreading or land farming)		
Review Date:	03/02/1994	Confirm Leak:	10/05/1989
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	09/30/1989	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	08/15/1993	Release Date:	09/18/1989

LUST Region 2:

Facility ID:	38-0198	Lat/Long:	37.7339340 / -122.4897000
Region:	2	Record Number:	4783
Entered Date:	12/22/1989	Last Review:	03/02/1994
Correspondence:	07/26/1992	Release Date:	09/18/1989
Case Number:	10131	Staff Initial:	VP
How Discovered:	Tank Closure	Discovered Date:	09/18/1989
How Stopped:	Tank Closure	Stopped Date:	09/18/1989
Leak Source:	Tank	Leak Cause:	Structure Failure
Facility Status:	Not reported		
Update Status:	File archived		
Review Status:	Not reported		
Priority:	Not reported		
Local Agency:	38000		
Case Type:	Other ground water or surface water is affected or threatened		

Primary Substance:	Gasoline
Secondary Substance:	Solvents
Maximum Soil Concentration:	16200
Maximum Groundwater Impact:	19000
Current Benzene in Groundwater:	1400
Maximum Benzene Concentration:	0
Nuber of Wells:	4
Depth to Groundwater:	86
MTBE Contamination Level:	0
Interim Remediation:	Yes
Interim Remediation Date:	04/06/1992
Lead Agency:	Local Agency
Case List:	FUEL
Enforcement Type:	0
Enforcement Date:	00/00/0000
Responsible Party Search:	Solvent - Identified and financially capable of performing work.
Funding:	Federal

Date Status Was First Assigned - The following dates are assigned as the status progresses:

Leak Confirmed:	10/05/1989
Workplan Submitted:	00/00/0000
Assessment Underway:	00/00/0000
Pollution Characterization:	09/30/1989
Corrective Action Plan:	00/00/0000
Enforcement Action Date:	Not reported
Remediation Underway:	00/00/0000
Monitoring Begun:	00/00/0000
Case Closed:	08/15/1993

Abatement: Excavate and Treat soil. (e.g. aeration, biodegradation, etc.)

LAKESHORE PLAZA (Continued) **S102432472**

Comments: ARCHIVED 11/1/96 CONTROL NO 120-072 072

South Bay Region 2:

Facility ID:	38-0198	Staff:	Not reported
Case Number:	Not reported	File Number:	Not reported
Last Update:	Not reported	Case Type:	Not reported
RWQCB Initials:	Not reported	EPA Contact:	Not reported
DOHS Initials:	Not reported	Map Number:	Not reported

Type: Other ground water or surface water is affected or threatened
Lead: Local Agency (Santa Clara Valley Water District
Facility Status: Not reported
Discovered Date: Not reported
Facility Description: Not reported
Phase of Work by Responsible Party: 9
National Priority List: NOT REPORTED
Primary Substance Spilled: Gasoline
Secondary Substance Spilled: Solvents
Problem Caused by UST: No
Contaminant Concentration Type (1): Not reported
Key Contaminant Concentration (1): Not reported
Initial Maximum Concentration (1): Not reported
Current Maximum Concentration (1): Not reported
Contaminant Concentration Type (2): Not reported
Key Contaminant Concentration (2): Not reported
Initial Maximum Concentration (2): Not reported
Current Maximum Concentration (2): Not reported
Contaminant Concentration Type (3): Not reported
Key Contaminant Concentration (3): Not reported
Initial Maximum Concentration (3): Not reported
Plume in Length (FT): Not reported
Size Depth (FT): Not reported
Municipal Drinking Wells Affected: Not reported
Private Drinking Wells Affected: Not reported
Current Maximum Concentration (3): Not reported
Historical Minimum Depth to Groundwater: 86 (Feet)
Maximum Soil Concentration of Contaminates: 16200 (parts per million)
Max Grndwater Concentration of Contaminates: 19000 (parts per billion)
Benzene: 1400
Maximum Benzene: 0
Soil Action Needed: Not reported
Total of Extraction Flow Rate: Not reported
Estimated % of Contaminants Contained: Not reported
Contaminant Source: Not reported
Contaminant Concentration as of: Not reported
Contaminant Concentration (1): Not reported
Well or Boring Number (1): Not reported
Initial Level Concentration (1): Not reported
Current Level Concentration (1): Not reported
Contaminant Concentration (2): Not reported
Well or Boring Number (2): Not reported
Initial Level Concentration (2): Not reported
Current Level Concentration (2): Not reported
Contaminant Concentration (3): Not reported
Well or Boring Number (3): Not reported
Initial Level Concentration (3): Not reported
Current Level Concentration (3): Not reported
Number of Municipal Wells: Not reported
Number of Private Wells: Not reported

LAKESHORE PLAZA (Continued) **S102432472**

Closure Name:	Not reported
Closure Date:	Not reported
Soil Action Needed Start Date:	Not reported
Soil Action Needed End Date:	Not reported
Onsite Water Action Needed:	Not reported
Onsite Water Action Needed Start Date:	Not reported
Onsite Water Action Needed End Date:	Not reported
Off Site Water Action Needed:	Not reported
Off Site Water Action Needed Start Date:	Not reported
Off Site Water Action Needed End Date:	Not reported
Estimated % of Contamination Concentration:	Not reported
Enforcement & Regulatory Action (1):	Not reported
Enforcement Action Date (1):	Not reported
Enforcement & Regulatory Action (2):	Not reported
Enforcement Action Date (2):	Not reported
Enforcement & Regulatory Action (3):	Not reported
Enforcement Action Date (3):	Not reported
Enforcement & Regulatory Action (4):	Not reported
Enforcement Action Date (4):	Not reported
Enforcement & Regulatory Action (5):	Not reported
Enforcement Action Date (5):	Not reported
Enforcement & Regulatory Action (6):	Not reported
Enforcement Action Date (6):	Not reported
Enforcement & Regulatory Action (7):	Not reported
Enforcement Action Date (7):	Not reported
Enforcement & Regulatory Action (8):	Not reported
Enforcement Action Date (8):	Not reported
Enforcement & Regulatory Action (9):	Not reported
Enforcement Action Date (9):	Not reported
Enforcement & Regulatory Action (10):	Not reported
Enforcement Action Date (10):	Not reported
Immediate Response Actions:	NOT REPORTED

Remediation:	Not reported
Characterization	Not reported
Comments	Not reported

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20 **NNW** **1/2-1** **Lower**	**FORMER UNOCAL** **2710 SLOAT BLVD.** **, CA 94116**	**LUST**	**U003199151** **N/A**

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
	FORMER UNOCAL (Continued)		**U003199151**

LUST San Francisco County:
Facility ID: 10278
Region: SAN FRANCISCO
Priority: 1B
Case Type: GW
Number of Tanks: 0
Cross Street: 45TH AVE
Free Product: No
Amount of Free Product: Not reported
Case Manager: CDM
MTBE: Not reported
Depth to Groundwater: Not reported
Gradient: Not reported
Benzine: Not reported
Primary Substance: Not reported
Basin: Not reported
Facility Contact: Not reported
Closed Number: 1
Comments: Not reported

E21 **ESE** **1/2-1** **Higher**	**CAL STATE UNIVERSITY, S.F.** **HOLLOWAY (1600)** **SAN FRANCISCO, CA**	**Cortese** **LUST**	**S101308300** **N/A**

LUST San Francisco County:
Facility ID: 10359
Region: SAN FRANCISCO
Priority: 0
Case Type: Soil only
Number of Tanks: 0
Cross Street: ALVISO STREET
Free Product: No
Amount of Free Product: Not reported
Case Manager: SC
MTBE: Not reported
Depth to Groundwater: Not reported
Gradient: Not reported
Benzine: Not reported
Primary Substance: Not reported
Basin: Not reported
Facility Contact: Not reported
Closed Number: 1
Comments: Not reported

CORTESE:
Facility ID: 38-000102 Data Source: LTNKA

E22 **ESE** **1/2-1** **Higher**	**CAL STATE UNIVERSITY S F** **1600 HOLLOWAY AVE** **SAN FRANCISCO, CA 94132**	**LUST** **S Bay Reg. 2**	**S102426049** **N/A**

CAL STATE UNIVERSITY S F (Continued) S102426049

State LUST:

Facility Type	INACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Heater Fuel		
Lead Agency:	Local Agency		
Case Type:	Soil only		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	No Action Taken - no action has as yet been taken at the site		
Review Date:	11/03/1995	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	11/03/1995	Release Date:	02/25/1987

Facility Type	INACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Heater Fuel		
Lead Agency:	Local Agency		
Case Type:	Soil only		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	No Action Taken - no action has as yet been taken at the site		
Review Date:	11/03/1995	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	11/03/1995	Release Date:	02/25/1987

LUST Region 2:

Facility ID:	38-0057	Lat/Long:	37.7207590 / -122.4750490
Region:	2	Record Number:	4643
Entered Date:	02/28/1989	Last Review:	11/03/1995
Correspondence:	11/03/1995	Release Date:	02/25/1987
Case Number:	10359	Staff Initial:	VP
How Discovered:	Tank Closure	Discovered Date:	02/25/1987
How Stopped:	Tank Closure	Stopped Date:	02/25/1987
Leak Source:	Tank	Leak Cause:	Structure Failure
Facility Status:	Not reported		
Update Status:	File archived		
Review Status:	Not reported		
Priority:	Not reported		
Local Agency:	38000		
Case Type:	Soil contamination has occured at such low levels as to not pose a threat to water quality. One of the following sets of conditions must be met: 1.) Initial soil contamination is less then 100 parts per million below the tank 2.) Low permeable soil (silts & clay) 3.) No shallow ground water, >50' Or 4.) Monitoring wells have been installed in appropriate locations and water analysis shows non-detect.		

Primary Substance:	Heater Fuel
Secondary Substance:	Diesel
Maximum Soil Concentration:	1445
Maximum Groundwater Impact:	Not reported
Current Benzene in Groundwater:	0
Maximum Benzene Concentration:	0
Nuber of Wells:	Not reported
Depth to Groundwater:	>45
MTBE Contamination Level:	0
Interim Remediation:	No

CAL STATE UNIVERSITY S F (Continued) **S102426049**

Interim Remediation Date: 00/00/0000
Lead Agency: Local Agency
Case List: FUEL
Enforcement Type: 0
Enforcement Date: 00/00/0000
Responsible Party Search: Solvent - Identified and financially capable of performing work.
Funding: Federal
Date Status Was First Assigned - The following dates are assigned as the status progresses:
  Leak Confirmed: 00/00/0000
  Workplan Submitted: 00/00/0000
  Assessment Underway: 00/00/0000
  Pollution Characterization: 00/00/0000
  Corrective Action Plan: 00/00/0000
  Enforcement Action Date: Not reported
  Remediation Underway: 00/00/0000
  Monitoring Begun: 00/00/0000
  Case Closed: 11/03/1995
Abatement: No Action Taken
Comments: ARCHIVED 4/25/96 CONTROL NO 120-027 027

South Bay Region 2:

Facility ID:	38-0057	Staff:	Not reported
Case Number:	Not reported	File Number:	Not reported
Last Update:	Not reported	Case Type:	Not reported
RWQCB Initials:	Not reported	EPA Contact:	Not reported
DOHS Initials:	Not reported	Map Number:	Not reported

Type: Only soil contamination has occurred and at such a low level as to not pose a threat to water quality
Lead: Local Agency (Santa Clara Valley Water District
Facility Status: Not reported
Discovered Date: Not reported
Facility Description: Not reported
Phase of Work by Responsible Party: 9
National Priority List: NOT REPORTED
Primary Substance Spilled: Heater Fuel
Secondary Substance Spilled: Diesel
Problem Caused by UST: No
Contaminant Concentration Type (1): Not reported
Key Contaminant Concentration (1): Not reported
Initial Maximum Concentration (1): Not reported
Current Maximum Concentration (1): Not reported
Contaminant Concentration Type (2): Not reported
Key Contaminant Concentration (2): Not reported
Initial Maximum Concentration (2): Not reported
Current Maximum Concentration (2): Not reported
Contaminant Concentration Type (3): Not reported
Key Contaminant Concentration (3): Not reported
Initial Maximum Concentration (3): Not reported
Plume in Length (FT): Not reported
Size Depth (FT): Not reported
Municipal Drinking Wells Affected: Not reported
Private Drinking Wells Affected: Not reported
Current Maximum Concentration (3): Not reported
Historical Minimum Depth to Groundwater: >45 (Feet)
Maximum Soil Concentration of Contaminates: 1445 (parts per million)
Max Grndwater Concentration of Contaminates: 0 (parts per billion)
Benzene: 0
Maximum Benzene: 0
Soil Action Needed: Not reported

CAL STATE UNIVERSITY S F (Continued) **S102426049**

Total of Extraction Flow Rate: Not reported
Estimated % of Contaminants Contained: Not reported
Contaminant Source: Not reported
Contaminant Concentration as of: Not reported
Contaminant Concentration (1): Not reported
Well or Boring Number (1): Not reported
Initial Level Concentration (1): Not reported
Current Level Concentration (1): Not reported
Contaminant Concentration (2): Not reported
Well or Boring Number (2): Not reported
Initial Level Concentration (2): Not reported
Current Level Concentration (2): Not reported
Contaminant Concentration (3): Not reported
Well or Boring Number (3): Not reported
Initial Level Concentration (3): Not reported
Current Level Concentration (3): Not reported
Number of Municipal Wells: Not reported
Number of Private Wells: Not reported
Closure Name: Not reported
Closure Date: Not reported
Soil Action Needed Start Date: Not reported
Soil Action Needed End Date: Not reported
Onsite Water Action Needed: Not reported
Onsite Water Action Needed Start Date: Not reported
Onsite Water Action Needed End Date: Not reported
Off Site Water Action Needed: Not reported
Off Site Water Action Needed Start Date: Not reported
Off Site Water Action Needed End Date: Not reported
Estimated % of Contamination Concentration: Not reported
Enforcement & Regulatory Action (1): Not reported
Enforcement Action Date (1): Not reported
Enforcement & Regulatory Action (2): Not reported
Enforcement Action Date (2): Not reported
Enforcement & Regulatory Action (3): Not reported
Enforcement Action Date (3): Not reported
Enforcement & Regulatory Action (4): Not reported
Enforcement Action Date (4): Not reported
Enforcement & Regulatory Action (5): Not reported
Enforcement Action Date (5): Not reported
Enforcement & Regulatory Action (6): Not reported
Enforcement Action Date (6): Not reported
Enforcement & Regulatory Action (7): Not reported
Enforcement Action Date (7): Not reported
Enforcement & Regulatory Action (8): Not reported
Enforcement Action Date (8): Not reported
Enforcement & Regulatory Action (9): Not reported
Enforcement Action Date (9): Not reported
Enforcement & Regulatory Action (10): Not reported
Enforcement Action Date (10): Not reported
Immediate Response Actions: NOT REPORTED
Remediation: Not reported
Characterization Not reported
Comments Not reported

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number
23 **ENE** **> 1** **Higher**	**333 EUCALYPTUS** **SAN FRANCISCO, CA 94132**	**CHMIRS**	**S100280378** **N/A**

(Continued) **S100280378**

CHMIRS:

OES Control Number:	9118161	DOT ID:	1760
DOT Hazard Class:	Corrosives		
Chemical Name:	MURIATIC ACID		
Extent of Release:	Not reported		
CAS Number:	Not reported	Quantity Released:	3
Environmental Contamination:	Other	Property Use:	099
Incident Date:	25-JUL-91	Date Completed:	25-JUL-91

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24 **ESE** **> 1** **Higher**	**ARCO** **JUNIPERO SERRA BLVD (1101)** **SAN FRANCISCO, CA 94132**	**Cortese** **LUST** **S Bay Reg. 2**	**S101302352** **N/A**

State LUST:

Facility Type	ACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Unleaded Gasoline		
Lead Agency:	Local Agency		
Case Type:	Other ground water affected		
Status:	Remediation plan developed		
Abate Method:	Excavate and Dispose - remove contaminated soil and dispose in approved site, Excavate and Treat - remove contaminated soil and treat (includes spreading or land farming), Replace Supply - provide alternative water supply to affected parties, Replace Supply - provide alternative water supply to affected parties		
Review Date:	06/23/1993	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	12/30/1987
Pollution Char:	Not reported	Remed Plan:	06/23/1993
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	Not reported	Release Date:	04/12/1990

CORTESE:

Facility ID: 38-000065 Data Source: LTNKA

South Bay Region 2:

Facility ID:	38-0012	Staff:	Not reported
Case Number:	Not reported	File Number:	Not reported
Last Update:	Not reported	Case Type:	Not reported
RWQCB Initials:	Not reported	EPA Contact:	Not reported
DOHS Initials:	Not reported	Map Number:	Not reported
Type:	Other ground water or surface water is affected or threatened		
Lead:	Local Agency (Santa Clara Valley Water District		
Facility Status:	Not reported		
Discovered Date:	Not reported		

Facility Description:	Not reported
Phase of Work by Responsible Party:	5
National Priority List:	NOT REPORTED
Primary Substance Spilled:	Unleaded Gasoline
Secondary Substance Spilled:	Waste Oil
Problem Caused by UST:	No
Contaminant Concentration Type (1):	Not reported
Key Contaminant Concentration (1):	Not reported
Initial Maximum Concentration (1):	Not reported
Current Maximum Concentration (1):	Not reported
Contaminant Concentration Type (2):	Not reported
Key Contaminant Concentration (2):	Not reported
Initial Maximum Concentration (2):	Not reported

ARCO (Continued) **S101302352**

Current Maximum Concentration (2): Not reported
Contaminant Concentration Type (3): Not reported
Key Contaminant Concentration (3): Not reported
Initial Maximum Concentration (3): Not reported
Plume in Length (FT): Not reported
Size Depth (FT): Not reported
Municipal Drinking Wells Affected: Not reported
Private Drinking Wells Affected: Not reported
Current Maximum Concentration (3): Not reported
Historical Minimum Depth to Groundwater: 15 (Feet)
Maximum Soil Concentration of Contaminates: 5900 (parts per million)
Max Grndwater Concentration of Contaminates: 0 (parts per billion)
Benzene: 0
Maximum Benzene: 0
Soil Action Needed: Not reported
Total of Extraction Flow Rate: Not reported
Estimated % of Contaminants Contained: Not reported
Contaminant Source: Not reported
Contaminant Concentration as of: Not reported
Contaminant Concentration (1): Not reported
Well or Boring Number (1): Not reported
Initial Level Concentration (1): Not reported
Current Level Concentration (1): Not reported
Contaminant Concentration (2): Not reported
Well or Boring Number (2): Not reported
Initial Level Concentration (2): Not reported
Current Level Concentration (2): Not reported
Contaminant Concentration (3): Not reported
Well or Boring Number (3): Not reported
Initial Level Concentration (3): Not reported
Current Level Concentration (3): Not reported
Number of Municipal Wells: Not reported
Number of Private Wells: Not reported
Closure Name: Not reported
Closure Date: Not reported
Soil Action Needed Start Date: Not reported
Soil Action Needed End Date: Not reported
Onsite Water Action Needed: Not reported
Onsite Water Action Needed Start Date: Not reported
Onsite Water Action Needed End Date: Not reported
Off Site Water Action Needed: Not reported
Off Site Water Action Needed Start Date: Not reported
Off Site Water Action Needed End Date: Not reported
Estimated % of Contamination Concentration: Not reported
Enforcement & Regulatory Action (1): Not reported
Enforcement Action Date (1): Not reported
Enforcement & Regulatory Action (2): Not reported
Enforcement Action Date (2): Not reported
Enforcement & Regulatory Action (3): Not reported
Enforcement Action Date (3): Not reported
Enforcement & Regulatory Action (4): Not reported
Enforcement Action Date (4): Not reported
Enforcement & Regulatory Action (5): Not reported
Enforcement Action Date (5): Not reported
Enforcement & Regulatory Action (6): Not reported
Enforcement Action Date (6): Not reported

ARCO (Continued) S101302352

Enforcement & Regulatory Action (7): Not reported
Enforcement Action Date (7): Not reported
Enforcement & Regulatory Action (8): Not reported
Enforcement Action Date (8): Not reported
Enforcement & Regulatory Action (9): Not reported
Enforcement Action Date (9): Not reported
Enforcement & Regulatory Action (10): Not reported
Enforcement Action Date (10): Not reported
Immediate Response Actions: NOT REPORTED
Remediation: Not reported
Characterization Not reported
Comments Not reported

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25 North > 1 Higher	**WINANS PROPERTY** **TARAVAL ST (2249)** **SAN FRANCISCO, CA**	Cortese LUST S Bay Reg. 2	S101308377 N/A

State LUST:

Facility Type	INACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Gasoline		
Lead Agency:	Local Agency		
Case Type:	Soil only		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	No Action Taken - no action has as yet been taken at the site		
Review Date:	05/31/1994	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	05/31/1994	Release Date:	01/23/1990

Facility Type	INACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Gasoline		
Lead Agency:	Local Agency		
Case Type:	Soil only		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	No Action Taken - no action has as yet been taken at the site		
Review Date:	05/31/1994	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	05/31/1994	Release Date:	01/23/1990

LUST Region 2:

Facility ID:	38-0433	Lat/Long:	37.7422000 / -122.4888880
Region:	2	Record Number:	5020
Entered Date:	03/02/1990	Last Review:	05/31/1994
Correspondence:	05/31/1994	Release Date:	01/23/1990
Case Number:	10269	Staff Initial:	VP
How Discovered:	Tank Closure	Discovered Date:	02/21/1990
How Stopped:	Tank Closure	Stopped Date:	02/21/1990
Leak Source:	Tank	Leak Cause:	Structure Failure
Facility Status:	Not reported		
Update Status:	File archived		
Review Status:	Not reported		
Priority:	Not reported		
Local Agency:	38000		

WINANS PROPERTY (Continued) S101308377

Case Type: Soil contamination has occured at such low levels as to not pose a threat to water quality. One of the following sets of conditions must be met: 1.) Initial soil contamination is less then 100 parts per million below the tank 2.) Low permeable soil (silts & clay) 3.) No shallow ground water, >50' Or 4.) Monitoring wells have been installed in appropriate locations and water analysis shows non-detect.
Primary Substance: Gasoline
Secondary Substance: Not reported
Maximum Soil Concentration: 0
Maximum Groundwater Impact: Not reported
Current Benzene in Groundwater: 0
Maximum Benzene Concentration: 0
Nuber of Wells: Not reported
Depth to Groundwater: Not reported
MTBE Contamination Level: 0
Interim Remediation: No
Interim Remediation Date: 00/00/0000
Lead Agency: Local Agency
Case List: FUEL
Enforcement Type: 0
Enforcement Date: 00/00/0000
Responsible Party Search: Solvent - Identified and financially capable of performing work.
Funding: Federal
Date Status Was First Assigned - The following dates are assigned as the status progresses:
  Leak Confirmed: 00/00/0000
  Workplan Submitted: 00/00/0000
  Assessment Underway: 00/00/0000
  Pollution Characterization: 00/00/0000
  Corrective Action Plan: 00/00/0000
  Enforcement Action Date: Not reported
  Remediation Underway: 00/00/0000
  Monitoring Begun: 00/00/0000
  Case Closed: 05/31/1994
Abatement: No Action Taken
Comments: ARCHIVED 5/2/96 CONTROL NO 120-037 037

LUST San Francisco County:
Facility ID: 10269
Region: SAN FRANCISCO
Priority: 2
Case Type: Soil only
Number of Tanks: 0
Cross Street: 35TH AVE.
Free Product: No
Amount of Free Product: Not reported
Case Manager: SC
MTBE: Not reported
Depth to Groundwater: Not reported
Gradient: Not reported
Benzine: Not reported
Primary Substance: Not reported
Basin: Not reported
Facility Contact: Not reported
Closed Number: 1
Comments: Not reported

CORTESE:
Facility ID: 38-000467 Data Source: LTNKA

WINANS PROPERTY (Continued) **S101308377**

South Bay Region 2:

Facility ID:	38-0433	Staff:	Not reported
Case Number:	Not reported	File Number:	Not reported
Last Update:	Not reported	Case Type:	Not reported
RWQCB Initials:	Not reported	EPA Contact:	Not reported
DOHS Initials:	Not reported	Map Number:	Not reported

Type: Only soil contamination has occurred and at such a low level as to not pose a threat to water quality
Lead: Local Agency (Santa Clara Valley Water District
Facility Status: Not reported
Discovered Date: Not reported

Facility Description:	Not reported
Phase of Work by Responsible Party:	9
National Priority List:	NOT REPORTED
Primary Substance Spilled:	Gasoline
Secondary Substance Spilled:	NOT REPORTED
Problem Caused by UST:	No
Contaminant Concentration Type (1):	Not reported
Key Contaminant Concentration (1):	Not reported
Initial Maximum Concentration (1):	Not reported
Current Maximum Concentration (1):	Not reported
Contaminant Concentration Type (2):	Not reported
Key Contaminant Concentration (2):	Not reported
Initial Maximum Concentration (2):	Not reported
Current Maximum Concentration (2):	Not reported
Contaminant Concentration Type (3):	Not reported
Key Contaminant Concentration (3):	Not reported
Initial Maximum Concentration (3):	Not reported
Plume in Length (FT):	Not reported
Size Depth (FT):	Not reported
Municipal Drinking Wells Affected:	Not reported
Private Drinking Wells Affected:	Not reported
Current Maximum Concentration (3):	Not reported
Historical Minimum Depth to Groundwater:	Not reported
Maximum Soil Concentration of Contaminates:	0 (parts per million)
Max Grndwater Concentration of Contaminates:	0 (parts per billion)
Benzene:	0
Maximum Benzene:	0
Soil Action Needed:	Not reported
Total of Extraction Flow Rate:	Not reported
Estimated % of Contaminants Contained:	Not reported
Contaminant Source:	Not reported
Contaminant Concentration as of:	Not reported
Contaminant Concentration (1):	Not reported
Well or Boring Number (1):	Not reported
Initial Level Concentration (1):	Not reported
Current Level Concentration (1):	Not reported
Contaminant Concentration (2):	Not reported
Well or Boring Number (2):	Not reported
Initial Level Concentration (2):	Not reported
Current Level Concentration (2):	Not reported
Contaminant Concentration (3):	Not reported
Well or Boring Number (3):	Not reported
Initial Level Concentration (3):	Not reported
Current Level Concentration (3):	Not reported
Number of Municipal Wells:	Not reported
Number of Private Wells:	Not reported
Closure Name:	Not reported

WINANS PROPERTY (Continued) **S101308377**

Closure Date:	Not reported
Soil Action Needed Start Date:	Not reported
Soil Action Needed End Date:	Not reported
Onsite Water Action Needed:	Not reported
Onsite Water Action Needed Start Date:	Not reported
Onsite Water Action Needed End Date:	Not reported
Off Site Water Action Needed:	Not reported
Off Site Water Action Needed Start Date:	Not reported
Off Site Water Action Needed End Date:	Not reported
Estimated % of Contamination Concentration:	Not reported
Enforcement & Regulatory Action (1):	Not reported
Enforcement Action Date (1):	Not reported
Enforcement & Regulatory Action (2):	Not reported
Enforcement Action Date (2):	Not reported
Enforcement & Regulatory Action (3):	Not reported
Enforcement Action Date (3):	Not reported
Enforcement & Regulatory Action (4):	Not reported
Enforcement Action Date (4):	Not reported
Enforcement & Regulatory Action (5):	Not reported
Enforcement Action Date (5):	Not reported
Enforcement & Regulatory Action (6):	Not reported
Enforcement Action Date (6):	Not reported
Enforcement & Regulatory Action (7):	Not reported
Enforcement Action Date (7):	Not reported
Enforcement & Regulatory Action (8):	Not reported
Enforcement Action Date (8):	Not reported
Enforcement & Regulatory Action (9):	Not reported
Enforcement Action Date (9):	Not reported
Enforcement & Regulatory Action (10):	Not reported
Enforcement Action Date (10):	Not reported
Immediate Response Actions:	NOT REPORTED
Remediation:	Not reported
Characterization	Not reported
Comments	Not reported

26	**DALY CITY WASTEWATER TREATMENT**	**Cortese**	**S100234031**
SSE	**LAKE MERCED BLVD (153)**	**LUST**	**N/A**
> 1	**DALY CITY, CA 94015**	**S Bay Reg. 2**	
Higher			

State LUST:

Facility Type	ACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Diesel		
Lead Agency:	Local Agency		
Case Type:	Soil only		
Status:	Leak being confirmed		
Abate Method:	No Action Taken - no action has as yet been taken at the site		
Review Date:	02/28/1990	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	Not reported	Release Date:	02/14/1990

LUST Region 2:

Facility ID:	41-0190	Lat/Long:	37.7028420 / -122.4842210
Region:	2	Record Number:	1428
Entered Date:	03/02/1990	Last Review:	02/28/1990
Correspondence:	06/01/1992	Release Date:	02/14/1990

DALY CITY WASTEWATER TREATMENT (Continued) **S100234031**

Case Number:	Not reported	Staff Initial:	RL
How Discovered:	Tank Closure	Discovered Date:	02/14/1990
How Stopped:	Tank Closure	Stopped Date:	02/14/1990
Leak Source:	Tank	Leak Cause:	Structure Failure

Facility Status: Not reported
Update Status: Not reported
Review Status: Not reported
Priority: Not reported
Local Agency: San Mateo County
Case Type: Soil contamination has occured at such low levels as to not pose a threat to water quality. One of the following sets of conditions must be met: 1.) Initial soil contamination is less then 100 parts per million below the tank 2.) Low permeable soil (silts & clay) 3.) No shallow ground water, >50' Or 4.) Monitoring wells have been installed in appropriate locations and water analysis shows non-detect.
Primary Substance: Diesel
Secondary Substance: Not reported
Maximum Soil Concentration: 330
Maximum Groundwater Impact: Not reported
Current Benzene in Groundwater: 0
Maximum Benzene Concentration: 0
Nuber of Wells: Not reported
Depth to Groundwater: Not reported
MTBE Contamination Level: Not reported
Interim Remediation: Yes
Interim Remediation Date: 00/00/0000
Lead Agency: Local Agency
Case List: FUEL
Enforcement Type: 0
Enforcement Date: 00/00/0000
Responsible Party Search: Not reported
Funding: Federal
Date Status Was First Assigned - The following dates are assigned as the status progresses:
Leak Confirmed: 00/00/0000
Workplan Submitted: 00/00/0000
Assessment Underway: 00/00/0000
Pollution Characterization: 00/00/0000
Corrective Action Plan: 00/00/0000
Enforcement Action Date: Not reported
Remediation Underway: 00/00/0000
Monitoring Begun: 00/00/0000
Case Closed: 00/00/0000
Abatement: No Action Taken

LUST San Mateo County:

Facility ID:	220029	Region:	SAN MATEO
Local ID:	001113	Number of Wells:	0
Initial Date:	07/18/91	Closed Date:	Not reported
Facility Status:	Identify and notify Responsible Party		
Lead Agency:	Local Lead, San Mateo County		

CORTESE:
Facility ID: 41-000209   Data Source: LTNKA

South Bay Region 2:

Facility ID:	41-0190	Staff:	Not reported
Case Number:	Not reported	File Number:	Not reported
Last Update:	Not reported	Case Type:	Not reported
RWQCB Initials:	Not reported	EPA Contact:	Not reported

DALY CITY WASTEWATER TREATMENT (Continued) **S100234031**

DOHS Initials: Not reported Map Number: Not reported
Type: Only soil contamination has occurred and at such a low level as to not pose a threat to water quality
Lead: Local agency is responsible for the cases but the case is not being activly overseen
Facility Status: Not reported
Discovered Date: Not reported
Facility Description: Not reported
Phase of Work by Responsible Party: 1
National Priority List: NOT REPORTED
Primary Substance Spilled: Diesel
Secondary Substance Spilled: NOT REPORTED
Problem Caused by UST: No
Contaminant Concentration Type (1): Not reported
Key Contaminant Concentration (1): Not reported
Initial Maximum Concentration (1): Not reported
Current Maximum Concentration (1): Not reported
Contaminant Concentration Type (2): Not reported
Key Contaminant Concentration (2): Not reported
Initial Maximum Concentration (2): Not reported
Current Maximum Concentration (2): Not reported
Contaminant Concentration Type (3): Not reported
Key Contaminant Concentration (3): Not reported
Initial Maximum Concentration (3): Not reported
Plume in Length (FT): Not reported
Size Depth (FT): Not reported
Municipal Drinking Wells Affected: Not reported
Private Drinking Wells Affected: Not reported
Current Maximum Concentration (3): Not reported
Historical Minimum Depth to Groundwater: Not reported
Maximum Soil Concentration of Contaminates: 330 (parts per million)
Max Grndwater Concentration of Contaminates: 0 (parts per billion)
Benzene: 0
Maximum Benzene: 0
Soil Action Needed: Not reported
Total of Extraction Flow Rate: Not reported
Estimated % of Contaminants Contained: Not reported
Contaminant Source: Not reported
Contaminant Concentration as of: Not reported
Contaminant Concentration (1): Not reported
Well or Boring Number (1): Not reported
Initial Level Concentration (1): Not reported
Current Level Concentration (1): Not reported
Contaminant Concentration (2): Not reported
Well or Boring Number (2): Not reported
Initial Level Concentration (2): Not reported
Current Level Concentration (2): Not reported
Contaminant Concentration (3): Not reported
Well or Boring Number (3): Not reported
Initial Level Concentration (3): Not reported
Current Level Concentration (3): Not reported
Number of Municipal Wells: Not reported
Number of Private Wells: Not reported
Closure Name: Not reported
Closure Date: Not reported
Soil Action Needed Start Date: Not reported
Soil Action Needed End Date: Not reported
Onsite Water Action Needed: Not reported
Onsite Water Action Needed Start Date: Not reported

DALY CITY WASTEWATER TREATMENT (Continued) **S100234031**

Onsite Water Action Needed End Date: Not reported
Off Site Water Action Needed: Not reported
Off Site Water Action Needed Start Date: Not reported
Off Site Water Action Needed End Date: Not reported
Estimated % of Contamination Concentration: Not reported
Enforcement & Regulatory Action (1): Not reported
Enforcement Action Date (1): Not reported
Enforcement & Regulatory Action (2): Not reported
Enforcement Action Date (2): Not reported
Enforcement & Regulatory Action (3): Not reported
Enforcement Action Date (3): Not reported
Enforcement & Regulatory Action (4): Not reported
Enforcement Action Date (4): Not reported
Enforcement & Regulatory Action (5): Not reported
Enforcement Action Date (5): Not reported
Enforcement & Regulatory Action (6): Not reported
Enforcement Action Date (6): Not reported
Enforcement & Regulatory Action (7): Not reported
Enforcement Action Date (7): Not reported
Enforcement & Regulatory Action (8): Not reported
Enforcement Action Date (8): Not reported
Enforcement & Regulatory Action (9): Not reported
Enforcement Action Date (9): Not reported
Enforcement & Regulatory Action (10): Not reported
Enforcement Action Date (10): Not reported
Immediate Response Actions: NOT REPORTED
Remediation: Not reported
Characterization Not reported
Comments Not reported

27	SF **CHINESE ALLIANCE CHURCH**	**Cortese**	**S100233588**
NE	**VICENTES ST (1150)**	**LUST**	**N/A**
> 1	**SAN FRANCISCO, CA**	**S Bay Reg. 2**	
Higher			

State LUST:

Facility Type	INACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Gasoline		
Lead Agency:	Local Agency		
Case Type:	Soil only		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	No Action Taken - no action has as yet been taken at the site		
Review Date:	08/15/1988	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	07/26/1994	Release Date:	12/22/1987

SF CHINESE ALLIANCE CHURCH (Continued) S100233588

Facility Type	INACTIVE	Cross Street:	Not reported
Reg Board:	San Francisco Bay Region	Qty Leaked:	Not reported
Chemical:	Gasoline		
Lead Agency:	Local Agency		
Case Type:	Soil only		
Status:	Signed off, remedial action completed or deemed unnecessary		
Abate Method:	No Action Taken - no action has as yet been taken at the site		
Review Date:	08/15/1988	Confirm Leak:	Not reported
Workplan:	Not reported	Prelim Assess:	Not reported
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	Not reported	Monitoring:	Not reported
Close Date:	07/26/1994	Release Date:	12/22/1987

LUST Region 2:

Facility ID:	38-0275	Lat/Long:	37.7392000 / -122.4778000
Region:	2	Record Number:	4860
Entered Date:	08/15/1988	Last Review:	08/15/1988
Correspondence:	12/24/1987	Release Date:	12/22/1987
Case Number:	10267	Staff Initial:	VP
How Discovered:	Tank Closure	Discovered Date:	12/22/1987
How Stopped:	Tank Closure	Stopped Date:	12/22/1987
Leak Source:	Tank	Leak Cause:	Structure Failure
Facility Status:	Not reported		
Update Status:	File archived		
Review Status:	Not reported		
Priority:	Not reported		
Local Agency:	38000		
Case Type:	Soil contamination has occured at such low levels as to not pose a threat to water quality. One of the following sets of conditions must be met: 1.) Initial soil contamination is less then 100 parts per million below the tank 2.) Low permeable soil (silts & clay) 3.) No shallow ground water, >50' Or 4.) Monitoring wells have been installed in appropriate locations and water analysis shows non-detect.		

Primary Substance:	Gasoline
Secondary Substance:	Not reported
Maximum Soil Concentration:	0
Maximum Groundwater Impact:	Not reported
Current Benzene in Groundwater:	0
Maximum Benzene Concentration:	0
Nuber of Wells:	Not reported
Depth to Groundwater:	Not reported
MTBE Contamination Level:	0
Interim Remediation:	No
Interim Remediation Date:	00/00/0000
Lead Agency:	Local Agency
Case List:	FUEL
Enforcement Type:	0
Enforcement Date:	00/00/0000
Responsible Party Search:	Solvent - Identified and financially capable of performing work.
Funding:	Federal

Date Status Was First Assigned - The following dates are assigned as the status progresses:

Leak Confirmed:	00/00/0000
Workplan Submitted:	00/00/0000
Assessment Underway:	00/00/0000
Pollution Characterization:	00/00/0000
Corrective Action Plan:	00/00/0000
Enforcement Action Date:	Not reported

SF CHINESE ALLIANCE CHURCH (Continued) **S100233588**

Remediation Underway: 00/00/0000
Monitoring Begun: 00/00/0000
Case Closed: 07/26/1994
Abatement: No Action Taken
Comments: ARCHIVED 5/2/96 CONTROL NO 120-032 032

LUST San Francisco County:
Facility ID: 10267
Region: SAN FRANCISCO
Priority: 2
Case Type: Soil only
Number of Tanks: 0
Cross Street: 23RD STREET
Free Product: No
Amount of Free Product: Not reported
Case Manager: SC
MTBE: Not reported
Depth to Groundwater: Not reported
Gradient: Not reported
Benzine: Not reported
Primary Substance: Not reported
Basin: Not reported
Facility Contact: Not reported
Closed Number: 1
Comments: Not reported

CORTESE:
Facility ID: 38-000314 Data Source: LTNKA

South Bay Region 2:

Facility ID:	38-0275	Staff:	Not reported
Case Number:	Not reported	File Number:	Not reported
Last Update:	Not reported	Case Type:	Not reported
RWQCB Initials:	Not reported	EPA Contact:	Not reported
DOHS Initials:	Not reported	Map Number:	Not reported

Type: Only soil contamination has occurred and at such a low level as to not pose a threat to water quality
Lead: Local Agency (Santa Clara Valley Water District
Facility Status: Not reported
Discovered Date: Not reported
Facility Description: Not reported
Phase of Work by Responsible Party: 9
National Priority List: NOT REPORTED
Primary Substance Spilled: Gasoline
Secondary Substance Spilled: NOT REPORTED
Problem Caused by UST: No
Contaminant Concentration Type (1): Not reported
Key Contaminant Concentration (1): Not reported
Initial Maximum Concentration (1): Not reported
Current Maximum Concentration (1): Not reported
Contaminant Concentration Type (2): Not reported
Key Contaminant Concentration (2): Not reported
Initial Maximum Concentration (2): Not reported
Current Maximum Concentration (2): Not reported
Contaminant Concentration Type (3): Not reported
Key Contaminant Concentration (3): Not reported
Initial Maximum Concentration (3): Not reported
Plume in Length (FT): Not reported
Size Depth (FT): Not reported
Municipal Drinking Wells Affected: Not reported

SF CHINESE ALLIANCE CHURCH (Continued) S100233588

Private Drinking Wells Affected: Not reported
Current Maximum Concentration (3): Not reported
Historical Minimum Depth to Groundwater: Not reported
Maximum Soil Concentration of Contaminates: 0 (parts per million)
Max Grndwater Concentration of Contaminates: 0 (parts per billion)
Benzene: 0
Maximum Benzene: 0
Soil Action Needed: Not reported
Total of Extraction Flow Rate: Not reported
Estimated % of Contaminants Contained: Not reported
Contaminant Source: Not reported
Contaminant Concentration as of: Not reported
Contaminant Concentration (1): Not reported
Well or Boring Number (1): Not reported
Initial Level Concentration (1): Not reported
Current Level Concentration (1): Not reported
Contaminant Concentration (2): Not reported
Well or Boring Number (2): Not reported
Initial Level Concentration (2): Not reported
Current Level Concentration (2): Not reported
Contaminant Concentration (3): Not reported
Well or Boring Number (3): Not reported
Initial Level Concentration (3): Not reported
Current Level Concentration (3): Not reported
Number of Municipal Wells: Not reported
Number of Private Wells: Not reported
Closure Name: Not reported
Closure Date: Not reported
Soil Action Needed Start Date: Not reported
Soil Action Needed End Date: Not reported
Onsite Water Action Needed: Not reported
Onsite Water Action Needed Start Date: Not reported
Onsite Water Action Needed End Date: Not reported
Off Site Water Action Needed: Not reported
Off Site Water Action Needed Start Date: Not reported
Off Site Water Action Needed End Date: Not reported
Estimated % of Contamination Concentration: Not reported
Enforcement & Regulatory Action (1): Not reported
Enforcement Action Date (1): Not reported
Enforcement & Regulatory Action (2): Not reported
Enforcement Action Date (2): Not reported
Enforcement & Regulatory Action (3): Not reported
Enforcement Action Date (3): Not reported
Enforcement & Regulatory Action (4): Not reported
Enforcement Action Date (4): Not reported
Enforcement & Regulatory Action (5): Not reported
Enforcement Action Date (5): Not reported
Enforcement & Regulatory Action (6): Not reported
Enforcement Action Date (6): Not reported
Enforcement & Regulatory Action (7): Not reported
Enforcement Action Date (7): Not reported
Enforcement & Regulatory Action (8): Not reported
Enforcement Action Date (8): Not reported
Enforcement & Regulatory Action (9): Not reported
Enforcement Action Date (9): Not reported
Enforcement & Regulatory Action (10): Not reported
Enforcement Action Date (10): Not reported

SF CHINESE ALLIANCE CHURCH (Continued) **S100233588**

Immediate Response Actions: NOT REPORTED

Remediation:	Not reported
Characterization	Not reported
Comments	Not reported

City	EDR ID	Site Name	Site Address	Zip	Database(s)	Facility ID
COUNTY	S102430327	FORMER SERVICE STATION	11 LAKESHORE PLAZA	94132	LUST	10131
SAN FRANCISCO	S101308409	FIGONE COLD STORAGE CORP.	17TH ST (420)		Cortese, LUST, S Bay Reg. 2	10236
SAN FRANCISCO	S101308419	SF MUNI RAILWAY MAINTENANCE	24TH / UTAH ST (NO STREET NB		Cortese, LUST, S Bay Reg. 2	38-000339
SAN FRANCISCO	1000819046	CALTRANS	RTE 480 MISSION ST TO 4TH ST	94105	RCRIS-SQG, FINDS, HAZNET	
SAN FRANCISCO	S100931786	CALTRANS	RTE 480 MISSION ST TO 4TH ST		HAZNET	
SAN FRANCISCO	S100182240	HILLS PLAZA	BNDRY: FOLSOM, STEUART, HARRIS	94105	Cal-Sites	38200003
SAN FRANCISCO	S101612767	BODEMIX	CANDLESTICK AKA 3 COM PARK		SWF/LF, WMUDS	38-CR-0012
SAN FRANCISCO	S101612791	FLORA CRANE	CANDLESTICK/3-COM PARK		SWF/LF	38-CR-0017
SAN FRANCISCO	S102362261	LOFTON	CANDLESTICK/3-COM PARK		SWF/LF	38-CR-0014
SAN FRANCISCO	S102362262	SF NORTH LANDFILL	CANDLESTICK/3-COM PARK		SWF/LF	38-CR-0015
SAN FRANCISCO	S102362263	SF SOUTH LANDFILL	CANDLESTICK/3-COM PARK		SWF/LF	38-CR-0016
SAN FRANCISCO	U001595770	ORGAN MAINT SHOP #36	END OF ZOO RD	94132	UST	00000057868
SAN FRANCISCO	U001595771	ORGANIZATIONAL MAINTENANCE SHO	END OF ZOO RD	94132	UST	00000059405
SAN FRANCISCO	S100941088	OMS #36	END OF ZOO RD (FT FUNSTEN)		HAZNET	
SAN FRANCISCO	S101592552	PARK MERCED APARTMENTS	1 FELIX AVE	94132	Ca. FID	38005411
SAN FRANCISCO	S100233419	SF RECREATION(GOLF COURSE)	HARDING BLVD (NO STREET NBR)		Cortese, LUST, S Bay Reg. 2	38-000357
SAN FRANCISCO	S100932290	CHEVRON LOUISIANA (VESSEL #584696)	HOMEPORT IS SAN FRANCISCO		HAZNET	
SAN FRANCISCO	S100932291	CHEVRON OREGON (VESSEL #566080)	HOMEPORT IS SAN FRANCISCO		HAZNET	
SAN FRANCISCO	S100858197	CHEVRON CALIFORNIA (VESSEL #541563	HOMEPORT OF SAN FRANCISCO		HAZNET	
SAN FRANCISCO	S100873653	SEARIVER LONG BEACH	HOMEPORT IS SAN FRANCISCO		HAZNET	
SAN FRANCISCO	S100944612	SEARIVER BENICIA	HOMEPORT IS SAN FRANCISCO		HAZNET	
SAN FRANCISCO	S100944615	SEARIVER NORTH SLOPE	HOMEPORT IS SAN FRANCISCO		HAZNET	
SAN FRANCISCO	S102362264	HUNTER'S POINT	HUNTER'S POINT NAVAL SHIPYARD		SWF/LF	38-CR-0018
SAN FRANCISCO	U001595775	SLOAT OLYMPIC	11 LAKESHORE PLAZA	94132	UST	00000059740
SAN FRANCISCO	S100857900	CCSF-PUC WATER-LAKE MERCED PMP	FT OF BROTHERHOOD WAY		HAZNET	
SAN FRANCISCO	S100926953	1X JEFF STEWART/VESSEL #101904572	14 OFF HUNTER POINT IN THE SAN		HAZNET	
SAN FRANCISCO	S102362250	PRESIDIO TRANSFER STATION	PARK BOULEVARD, THE PRESIDIO		SWF/LF	38-AA-0002
SAN FRANCISCO	S102362256	CITY COLLEGE OF SF PHELAN CAMPUS	50 PHELAN AVE BOX S193 OFFICE		SWF/LF	38-AA-0009
SAN FRANCISCO	S101310891	LEONETTI	PIER 98		SWF/LF, WMUDS	38-CR-0009
SAN FRANCISCO	S101612152	SF PIER 94	PIER 94		SWF/LF, WMUDS	38-CR-0007
SAN FRANCISCO	S101310895	MIRZA	PIER 98		SWF/LF	38-CR-0010
SAN FRANCISCO	S100942748	PRESIDIO OF SAN FRANCISCO	PRESIDIO OF SAN FRANCISCO		HAZNET	38-CR-0019
SAN FRANCISCO	1000819544	MV RJ PFEIFFER OFF NO 979814	SAN FRANCISCO HOMEPORT	94105	RCRIS-SQG, FINDS, HAZNET	
SAN FRANCISCO	S100857898	CCSF-POLICE ACADEMY	SAN FRANCISCO POLICE ACADEMY		HAZNET	
SAN FRANCISCO	S100936855	HERTZ RENT-A-CAR	SAN FRANCISCO AIRPORT		HAZNET	
SAN FRANCISCO	S100851530	1X LONDON VICTORY, THE VESSEL #VI	SAN FRANCISCO ANCHORAGE #9		HAZNET	
SAN FRANCISCO	S100940520	MV RJ PFEIFFER OFF NO 979814	SAN FRANCISCO HOMEPORT		HAZNET	
SAN FRANCISCO	U001595769	HARDING PARK	SKYLINE & HARDING PARK ROAD	94132	UST	00000059927
SAN FRANCISCO	S100945763	STATE OF CALIFORNIA	STATE COMP INSURANCE FUND		HAZNET	
SAN FRANCISCO	S100858813	CITY/COUNTY OF SAN FRANCISCO	SUNSET RECREATION CENTER		HAZNET	

GEOCHECK VERSION 2.1 ADDENDUM
FEDERAL DATABASE WELL INFORMATION

Well Closest to Target Property (Northern Quadrant)

BASIC WELL DATA

Site ID:	374411122285001	Distance from TP:	1 - 2 Miles
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	Not Reported	County:	San Francisco
Altitude:	83.90 ft.	State:	California
Well Depth:	Not Reported	Topographic Setting:	Valley flat
Depth to Water Table:	Not Reported	Prim. Use of Site:	Observation
Date Measured:	Not Reported	Prim. Use of Water:	Unused

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	22.49 ft.	Water Level:	25.58 ft.	Water Level:	20.66 ft.	Water Level:	20.85 ft.
Date Measured:	10/01/87	Date Measured:	10/28/87	Date Measured:	11/05/87	Date Measured:	12/09/87
Water Level:	20.29 ft.	Water Level:	20.30 ft.	Water Level:	20.20 ft.	Water Level:	19.93 ft.
Date Measured:	01/15/88	Date Measured:	02/24/88	Date Measured:	03/28/88	Date Measured:	04/20/88
Water Level:	20.17 ft.	Water Level:	20.59 ft.	Water Level:	21.13 ft.	Water Level:	23.32 ft.
Date Measured:	05/18/88	Date Measured:	06/14/88	Date Measured:	07/19/88	Date Measured:	08/15/88
Water Level:	21.35 ft.	Water Level:	21.03 ft.	Water Level:	21.00 ft.	Water Level:	21.24 ft.
Date Measured:	09/26/88	Date Measured:	11/09/88	Date Measured:	01/04/89	Date Measured:	02/07/89
Water Level:	21.27 ft.	Water Level:	21.17 ft.	Water Level:	21.92 ft.	Water Level:	23.03 ft.
Date Measured:	03/14/89	Date Measured:	04/24/89	Date Measured:	05/31/89	Date Measured:	07/06/89
Water Level:	23.22 ft.	Water Level:	24.25 ft.	Water Level:	22.93 ft.	Water Level:	23.02 ft.
Date Measured:	08/15/89	Date Measured:	09/18/89	Date Measured:	10/24/89	Date Measured:	11/20/89
Water Level:	22.82 ft.	Water Level:	23.03 ft.	Water Level:	25.05 ft.	Water Level:	25.07 ft.
Date Measured:	12/05/89	Date Measured:	02/07/90	Date Measured:	03/06/90	Date Measured:	05/02/90
Water Level:	25.78 ft.	Water Level:	23.92 ft.	Water Level:	24.19 ft.	Water Level:	24.38 ft.
Date Measured:	06/05/90	Date Measured:	07/02/90	Date Measured:	08/02/90	Date Measured:	09/05/90
Water Level:	24.18 ft.	Water Level:	24.66 ft.	Water Level:	24.48 ft.	Water Level:	24.62 ft.
Date Measured:	10/10/90	Date Measured:	11/07/90	Date Measured:	12/04/90	Date Measured:	02/05/91
Water Level:	24.80 ft.	Water Level:	25.66 ft.	Water Level:	26.11 ft.	Water Level:	27.34 ft.
Date Measured:	05/02/91	Date Measured:	09/18/91	Date Measured:	02/05/92	Date Measured:	06/11/92
Water Level:	27.57 ft.						
Date Measured:	09/15/92						

GEOCHECK VERSION 2.1
FEDERAL DATABASE WELL INFORMATION

Well Closest to Target Property (Eastern Quadrant)

BASIC WELL DATA

Site ID:	374306122285801	Distance from TP:	1/2 - 1 Mile
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	1988	County:	San Francisco
Altitude:	90.00 ft.	State:	California
Well Depth:	87.00 ft.	Topographic Setting:	Undulating
Depth to Water Table:	Not Reported	Prim. Use of Site:	Observation
Date Measured:	Not Reported	Prim. Use of Water:	Unused

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Water Level:	82.56 ft.	Water Level:	80.18 ft.	Water Level:	80.23 ft.	Water Level:	80.33 ft.
Date Measured:	07/18/90	Date Measured:	08/01/90	Date Measured:	08/02/90	Date Measured:	09/05/90
Water Level:	80.20 ft.	Water Level:	80.21 ft.	Water Level:	80.23 ft.	Water Level:	80.20 ft.
Date Measured:	10/10/90	Date Measured:	11/06/90	Date Measured:	12/04/90	Date Measured:	02/06/91
Water Level:	80.31 ft.	Water Level:	80.93 ft.	Water Level:	81.58 ft.	Water Level:	81.84 ft.
Date Measured:	05/02/91	Date Measured:	09/18/91	Date Measured:	02/05/92	Date Measured:	06/11/92
Water Level:	Not Reported						
Date Measured:	09/16/92						

GEOCHECK VERSION 2.1
FEDERAL DATABASE WELL INFORMATION

Well Closest to Target Property (Southern Quadrant)

BASIC WELL DATA

Site ID:	374108122275601	Distance from TP:	>2 Miles
Site Type:	Single well, other than collector or Ranney type		
Year Constructed:	1959	County:	San Mateo
Altitude:	180.00 ft.	State:	California
Well Depth:	532.00 ft.	Topographic Setting:	Flat surface
Depth to Water Table:	Not Reported	Prim. Use of Site:	Withdrawal of water
Date Measured:	Not Reported	Prim. Use of Water:	Public supply

LITHOLOGIC DATA

Not Reported

WATER LEVEL VARIABILITY

Not Reported

GEOCHECK VERSION 2.1
STATE DATABASE WELL INFORMATION

Water Wells:

Well Within 1/2 - 1 Mile of Target Property (Eastern Quadrant)

Water System Information:

Prime Station Code:	03S/06W-02R01 M	User ID:	ENG
FRDS Number Number:	4110013001	County:	San Mateo
District Number:	04	Station Type:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	374300.0 1222900.0	Precision:	0.5 Mile (30 Seconds)
Source Name:	WELL 01		
System Number:	4110013		
System Name:	DALY CITY MWU		
Owner Type:	Not Reported		
Organization That Operates System:	153 LAKE MERCED BLVD. DALY CITY, CA 94015		
Pop Served:	92311	Connections:	DALY CITY
Area Served:	Not Reported		

Sample Information: * Only Findings Above Detection Level Are Listed

Sample Collected:	04/09/1985	Findings:	5.000 UNITS
Chemical:	COLOR		
Sample Collected:	04/09/1985	Findings:	804.000
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	04/09/1985	Findings:	7.500
Chemical:	PH (LABORATORY)		
Sample Collected:	04/09/1985	Findings:	146.000 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	04/09/1985	Findings:	246.000 MG/L
Chemical:	TOTAL HARDNESS (AS CACO3)		
Sample Collected:	04/09/1985	Findings:	36.000 MG/L
Chemical:	CALCIUM		
Sample Collected:	04/09/1985	Findings:	38.000 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	04/09/1985	Findings:	61.000 MG/L
Chemical:	SODIUM		
Sample Collected:	04/09/1985	Findings:	98.000 MG/L
Chemical:	CHLORIDE		
Sample Collected:	04/09/1985	Findings:	20.000 UG/L
Chemical:	CHROMIUM (TOTAL)		
Sample Collected:	04/09/1985	Findings:	40.000 UG/L
Chemical:	LEAD		
Sample Collected:	04/09/1985	Findings:	.140 UG/L
Chemical:	FOAMING AGENTS (MBAS)		
Sample Collected:	04/09/1985	Findings:	394.000 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	04/09/1985	Findings:	38.000 MG/L
Chemical:	NITRATE (AS NO3)		

Sample Collected: 04/09/1985 Findings: .060 NTU
Chemical: TURBIDITY (LAB)

Sample Collected: 11/22/1985 Findings: .700 UG/L
Chemical: CHLOROFORM (THM)

Sample Collected: 01/23/1987 Findings: 1.570 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 05/15/1987 Findings: 2.000 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 05/15/1987 Findings: 11.000 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 09/21/1987 Findings: 1.000 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 12/14/1987 Findings: .700 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 12/14/1987 Findings: - 28.000 PC/L
Chemical: GROSS BETA

Sample Collected: 12/14/1987 Findings: 26.000 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 12/21/1987 Findings: .600 UG/L
Chemical: CHLOROFORM (THM)

Sample Collected: 12/21/1987 Findings: 5.000 UG/L
Chemical: DICHLOROMETHANE

Sample Collected: 10/20/1988 Findings: 2.100 UG/L
Chemical: CHLOROFORM (THM)

Sample Collected: 10/20/1988 Findings: 2.100 UG/L
Chemical: TOTAL TRIHALOMETHANES

Sample Collected: 12/27/1988 Findings: 1.000 UNITS
Chemical: COLOR

Sample Collected: 12/27/1988 Findings: 1010.000
Chemical: SPECIFIC CONDUCTANCE

Sample Collected: 12/27/1988 Findings: 7.400
Chemical: PH (LABORATORY)

Sample Collected: 12/27/1988 Findings: 160.000 MG/L
Chemical: TOTAL ALKALINITY (AS CACO3)

Sample Collected: 12/27/1988 Findings: 160.000 MG/L
Chemical: BICARBONATE ALKALINITY

Sample Collected: 12/27/1988 Findings: 287.000 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 12/27/1988 Findings: 39.000 MG/L
Chemical: CALCIUM

Sample Collected: 12/27/1988 Findings: 47.000 MG/L
Chemical: MAGNESIUM

Sample Collected: 12/27/1988 Findings: 74.000 MG/L
Chemical: SODIUM

Sample Collected: 12/27/1988 Findings: 2.000 MG/L
Chemical: POTASSIUM

Sample Collected: 12/27/1988 Findings: 100.000 MG/L
Chemical: CHLORIDE

Sample Collected: 12/27/1988 Findings: 20.000 UG/L
Chemical: CHROMIUM (TOTAL)

Sample Collected: 12/27/1988 Findings: 510.000 MG/L
Chemical: TOTAL DISSOLVED SOLIDS

Sample Collected: 12/27/1988 Findings: 53.000 MG/L
Chemical: NITRATE (AS NO3)

Sample Collected: 12/27/1988 Findings: .070 NTU
Chemical: TURBIDITY (LAB)

Sample Collected: 08/16/1989 Findings: .700 UG/L
Chemical: CHLOROFORM (THM)

Sample Collected: 08/16/1989 Findings: .700 UG/L
Chemical: TOTAL TRIHALOMETHANES

Sample Collected: 03/05/1991 Findings: 2.200 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 08/05/1991 Findings: 2.200 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 02/18/1992 Findings: 1.500 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 05/11/1992 Findings: 1.300 PC/L
Chemical: GROSS ALPHA

Sample Collected: 05/11/1992 Findings: 2.600 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 05/11/1992 Findings: 3.500 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 07/06/1992 Findings: .560 UG/L
Chemical: CHLOROFORM (THM)

Sample Collected: 11/17/1992 Findings: 800.000
Chemical: SPECIFIC CONDUCTANCE

Sample Collected: 11/17/1992 Findings: 7.300
Chemical: PH (LABORATORY)

Sample Collected: 11/17/1992 Findings: 180.000 MG/L
Chemical: TOTAL ALKALINITY (AS CACO3)

Sample Collected: 11/17/1992 Findings: 180.000 MG/L
Chemical: BICARBONATE ALKALINITY

Sample Collected: 11/17/1992 Findings: 270.000 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 11/17/1992 Findings: 39.000 MG/L
Chemical: CALCIUM

Sample Collected: 11/17/1992 Findings: 43.000 MG/L
Chemical: MAGNESIUM

Sample Collected: 11/17/1992 Findings: 66.000 MG/L
Chemical: SODIUM

Sample Collected: 11/17/1992 Findings: 2.400 MG/L
Chemical: POTASSIUM

Sample Collected:	11/17/1992	Findings:	100.000 MG/L
Chemical:	CHLORIDE		
Sample Collected:	11/17/1992	Findings:	.160 MG/L
Chemical:	FLUORIDE (TEMPERATURE DEPENDENT)		
Sample Collected:	11/17/1992	Findings:	15.000 UG/L
Chemical:	CHROMIUM (TOTAL)		
Sample Collected:	11/17/1992	Findings:	1.400 PC/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	11/17/1992	Findings:	6.800 PC/L
Chemical:	GROSS BETA		
Sample Collected:	11/17/1992	Findings:	3.500 PC/L
Chemical:	GROSS BETA COUNTING ERROR		
Sample Collected:	11/17/1992	Findings:	490.000 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	11/17/1992	Findings:	55.000 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	02/01/1993	Findings:	1.200 PC/L
Chemical:	GROSS ALPHA		
Sample Collected:	02/01/1993	Findings:	1.900 PC/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	02/01/1993	Findings:	3.200 PC/L
Chemical:	GROSS BETA COUNTING ERROR		

Well Within >2 Miles of Target Property (Southern Quadrant)

Water System Information:

Prime Station Code:	03S/06W-01Q01 M	User ID:	ENG
FRDS Number Number:	4110013010	County:	San Mateo
District Number:	04	Station Type:	WELL/AMBNT
Water Type:	Well/Groundwater	Well Status:	Inactive Raw
Source Lat/Long:	374146.0 1222827.0	Precision:	0.5 Mile (30 Seconds)
Source Name:	JEFFERSON WELL - INACTIVE		
System Number:	4110013		
System Name:	DALY CITY MWU		
Owner Type:	Not Reported		
Organization That Operates System:	153 LAKE MERCED BLVD. DALY CITY, CA 94015		
Pop Served:	92311	Connections:	DALY CITY
Area Served:	Not Reported		

Sample Information: * Only Findings Above Detection Level Are Listed

Sample Collected:	11/17/1992	Findings:	450.000
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	11/17/1992	Findings:	7.800
Chemical:	PH (LABORATORY)		
Sample Collected:	11/17/1992	Findings:	140.000 MG/L
Chemical:	TOTAL ALKALINITY (AS CACO3)		
Sample Collected:	11/17/1992	Findings:	140.000 MG/L
Chemical:	BICARBONATE ALKALINITY		

Sample Collected: 11/17/1992 Findings: 150.000 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 11/17/1992 Findings: 22.000 MG/L
Chemical: CALCIUM

Sample Collected: 11/17/1992 Findings: 37.000 MG/L
Chemical: SODIUM

Sample Collected: 11/17/1992 Findings: 2.800 MG/L
Chemical: POTASSIUM

Sample Collected: 11/17/1992 Findings: 66.000 MG/L
Chemical: CHLORIDE

Sample Collected: 11/17/1992 Findings: .140 MG/L
Chemical: FLUORIDE (TEMPERATURE DEPENDENT)

Sample Collected: 11/17/1992 Findings: 51.000 UG/L
Chemical: MANGANESE

Sample Collected: 11/17/1992 Findings: 1.500 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 11/17/1992 Findings: 2.700 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 11/17/1992 Findings: 270.000 MG/L
Chemical: TOTAL DISSOLVED SOLIDS

Sample Collected: 11/17/1992 Findings: 6.600 MG/L
Chemical: NITRATE (AS NO3)

Sample Collected: 02/01/1993 Findings: 1.200 PC/L
Chemical: GROSS ALPHA

Sample Collected: 02/01/1993 Findings: 1.500 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 02/01/1993 Findings: 2.500 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 05/17/1993 Findings: 2.000 PC/L
Chemical: GROSS ALPHA

Sample Collected: 05/17/1993 Findings: 2.000 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 05/17/1993 Findings: 2.800 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 11/04/1993 Findings: 460.000
Chemical: SPECIFIC CONDUCTANCE

Sample Collected: 11/04/1993 Findings: 7.800
Chemical: PH (LABORATORY)

Sample Collected: 11/04/1993 Findings: 130.000 MG/L
Chemical: BICARBONATE ALKALINITY

Sample Collected: 11/04/1993 Findings: 200.000 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 11/04/1993 Findings: 21.000 MG/L
Chemical: CALCIUM

Sample Collected: 11/04/1993 Findings: 29.000 MG/L
Chemical: SODIUM

GEOCHECK VERSION 2.1
STATE DATABASE WELL INFORMATION

Sample Collected: 11/04/1993 Findings: 2.000 MG/L
Chemical: POTASSIUM

Sample Collected: 11/04/1993 Findings: 46.000 MG/L
Chemical: CHLORIDE

Sample Collected: 11/04/1993 Findings: .850 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 11/04/1993 Findings: 2.800 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 11/04/1993 Findings: 300.000 MG/L
Chemical: TOTAL DISSOLVED SOLIDS

Sample Collected: 11/04/1993 Findings: 26.000 MG/L
Chemical: NITRATE (AS NO3)

Sample Collected: 11/09/1994 Findings: 810.000
Chemical: SPECIFIC CONDUCTANCE

Sample Collected: 11/09/1994 Findings: 8.100
Chemical: PH (LABORATORY)

Sample Collected: 11/09/1994 Findings: 130.000 MG/L
Chemical: BICARBONATE ALKALINITY

Sample Collected: 11/09/1994 Findings: 170.000 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 11/09/1994 Findings: 22.000 MG/L
Chemical: CALCIUM

Sample Collected: 11/09/1994 Findings: 39.000 MG/L
Chemical: SODIUM

Sample Collected: 11/09/1994 Findings: 2.000 MG/L
Chemical: POTASSIUM

Sample Collected: 11/09/1994 Findings: 62.000 MG/L
Chemical: CHLORIDE

Sample Collected: 11/09/1994 Findings: 46.000 UG/L
Chemical: MANGANESE

Sample Collected: 11/09/1994 Findings: 260.000 MG/L
Chemical: TOTAL DISSOLVED SOLIDS

Sample Collected: 11/09/1994 Findings: 9.100 MG/L
Chemical: NITRATE (AS NO3)

Sample Collected: 10/19/1995 Findings: 410.000
Chemical: SPECIFIC CONDUCTANCE

Sample Collected: 10/19/1995 Findings: 8.000
Chemical: PH (LABORATORY)

Sample Collected: 10/19/1995 Findings: 120.000 MG/L
Chemical: BICARBONATE ALKALINITY

Sample Collected: 10/19/1995 Findings: 160.000 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 10/19/1995 Findings: 21.000 MG/L
Chemical: CALCIUM

Sample Collected: 10/19/1995 Findings: 37.000 MG/L
Chemical: SODIUM

Sample Collected:	10/19/1995	Findings:	2.100 MG/L
Chemical:	POTASSIUM		
Sample Collected:	10/19/1995	Findings:	61.000 MG/L
Chemical:	CHLORIDE		
Sample Collected:	10/19/1995	Findings:	44.000 UG/L
Chemical:	MANGANESE		
Sample Collected:	10/19/1995	Findings:	280.000 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	10/19/1995	Findings:	9.600 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/15/1996	Findings:	420.000
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	10/15/1996	Findings:	8.200
Chemical:	PH (LABORATORY)		
Sample Collected:	10/15/1996	Findings:	120.000 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	10/15/1996	Findings:	140.000 MG/L
Chemical:	TOTAL HARDNESS (AS CACO3)		
Sample Collected:	10/15/1996	Findings:	21.000 MG/L
Chemical:	CALCIUM		
Sample Collected:	10/15/1996	Findings:	35.000 MG/L
Chemical:	SODIUM		
Sample Collected:	10/15/1996	Findings:	1.300 MG/L
Chemical:	POTASSIUM		
Sample Collected:	10/15/1996	Findings:	58.000 MG/L
Chemical:	CHLORIDE		
Sample Collected:	10/15/1996	Findings:	37.000 UG/L
Chemical:	MANGANESE		
Sample Collected:	10/15/1996	Findings:	10.000 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	10/15/1996	Findings:	6.500 MG/L
Chemical:	NITRATE (AS NO3)		
Sample Collected:	10/15/1996	Findings:	.020 NTU
Chemical:	TURBIDITY (LAB)		

Well Within 1/8 - 1/4 Mile of Target Property (Western Quadrant)

Water System Information:

Prime Station Code:	D38/001-MRCED-R	User ID:	ENG
FRDS Number Number:	3810001005	County:	San Francisco
District Number:	04	Station Type:	LAKE/AMBNT/MUN/INTAKE
Water Type:	Surface Water	Well Status:	Inactive Raw
Source Lat/Long:	374325.2 1222947.5	Precision:	0.5 Mile (30 Seconds)
Source Name:	LAKE MERCED-RAW - INACTIVE		
System Number:	3810001		
System Name:	SF Public Utilities Commission		
Owner Type:	Not Reported		
Organization That Operates System:			
	1155 MARKET ST. SAN FRANCISCO, CA 94103		
Pop Served:	750000	Connections:	Not Reported
Area Served:	Not Reported		

Sample Information: *** Only Findings Above Detection Level Are Listed**

Sample Collected: 11/12/1986 Findings: 15.600 C
Chemical: SOURCE TEMPERATURE C

Sample Collected: 11/12/1986 Findings: 50.000 UNITS
Chemical: COLOR

Sample Collected: 11/12/1986 Findings: 576.000
Chemical: SPECIFIC CONDUCTANCE

Sample Collected: 11/12/1986 Findings: 9.000
Chemical: FIELD PH

Sample Collected: 11/12/1986 Findings: 180.800 MG/L
Chemical: TOTAL ALKALINITY (AS CACO3)

Sample Collected: 11/12/1986 Findings: 200.000 MG/L
Chemical: BICARBONATE ALKALINITY

Sample Collected: 11/12/1986 Findings: 10.000 MG/L
Chemical: CARBONATE ALKALINITY

Sample Collected: 11/12/1986 Findings: .070 UG/L
Chemical: PHOSPHATE

Sample Collected: 11/12/1986 Findings: 184.600 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 11/12/1986 Findings: 28.900 MG/L
Chemical: CALCIUM

Sample Collected: 11/12/1986 Findings: 49.200 MG/L
Chemical: SODIUM

Sample Collected: 11/12/1986 Findings: 1.580
Chemical: SODIUM ABSORPTION RATIO

Sample Collected: 11/12/1986 Findings: 1.800 MG/L
Chemical: POTASSIUM

Sample Collected: 11/12/1986 Findings: 71.000 MG/L
Chemical: CHLORIDE

Sample Collected: 11/12/1986 Findings: .250 MG/L
Chemical: FLUORIDE (TEMPERATURE DEPENDENT)

Sample Collected: 11/12/1986 Findings: 29.500 MG/L
Chemical: SILICA

Sample Collected: 11/12/1986 Findings: 70.000 UG/L
Chemical: MANGANESE

Sample Collected: 11/12/1986 Findings: 356.000 MG/L
Chemical: TOTAL DISSOLVED SOLIDS

Sample Collected: 11/12/1986 Findings: .940
Chemical: LANGELIER INDEX @ 60 C

Sample Collected: 11/12/1986 Findings: .940
Chemical: LANGELIER INDEX @ SOURCE TEMP.

Sample Collected: 11/12/1986 Findings: .400 NTU
Chemical: TURBIDITY (LAB)

Sample Collected: 11/12/1986 Findings: 13.120
Chemical: AGRESSIVENESS INDEX

Sample Collected: 09/17/1987 Findings: 10.000 UNITS
Chemical: COLOR

Sample Collected:	09/17/1987	Findings:	650.000
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	09/17/1987	Findings:	8.200
Chemical:	PH (LABORATORY)		
Sample Collected:	09/17/1987	Findings:	197.000 MG/L
Chemical:	TOTAL ALKALINITY (AS CACO3)		
Sample Collected:	09/17/1987	Findings:	240.000 MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	09/17/1987	Findings:	.020 UG/L
Chemical:	PHOSPHATE		
Sample Collected:	09/17/1987	Findings:	207.000 MG/L
Chemical:	TOTAL HARDNESS (AS CACO3)		
Sample Collected:	09/17/1987	Findings:	33.200 MG/L
Chemical:	CALCIUM		
Sample Collected:	09/17/1987	Findings:	30.100 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	09/17/1987	Findings:	59.600 MG/L
Chemical:	SODIUM		
Sample Collected:	09/17/1987	Findings:	2.100 MG/L
Chemical:	POTASSIUM		
Sample Collected:	09/17/1987	Findings:	84.000 MG/L
Chemical:	CHLORIDE		
Sample Collected:	09/17/1987	Findings:	.350 MG/L
Chemical:	FLUORIDE (TEMPERATURE DEPENDENT)		
Sample Collected:	09/17/1987	Findings:	14.400 NTU
Chemical:	TURBIDITY (LAB)		
Sample Collected:	09/24/1991	Findings:	20.000 UNITS
Chemical:	COLOR		
Sample Collected:	09/24/1991	Findings:	851.000
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	09/24/1991	Findings:	8.200
Chemical:	PH (LABORATORY)		
Sample Collected:	09/24/1991	Findings:	278.000 MG/L
Chemical:	TOTAL ALKALINITY (AS CACO3)		
Sample Collected:	09/24/1991	Findings:	.050 UG/L
Chemical:	PHOSPHATE		
Sample Collected:	09/24/1991	Findings:	292.000 MG/L
Chemical:	TOTAL HARDNESS (AS CACO3)		
Sample Collected:	09/24/1991	Findings:	45.000 MG/L
Chemical:	CALCIUM		
Sample Collected:	09/24/1991	Findings:	44.000 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	09/24/1991	Findings:	2.400 MG/L
Chemical:	POTASSIUM		
Sample Collected:	09/24/1991	Findings:	100.000 MG/L
Chemical:	CHLORIDE		

Sample Collected: 09/24/1991 Findings: 42.000 MG/L
Chemical: SILICA

Sample Collected: 09/24/1991 Findings: 160.000 UG/L
Chemical: IRON

Sample Collected: 09/24/1991 Findings: 100.000 UG/L
Chemical: ALUMINUM

Sample Collected: 09/24/1991 Findings: 511.000 MG/L
Chemical: TOTAL DISSOLVED SOLIDS

Sample Collected: 09/24/1991 Findings: 7.700 NTU
Chemical: TURBIDITY (LAB)

Sample Collected: 10/13/1993 Findings: 726.000
Chemical: SPECIFIC CONDUCTANCE

Sample Collected: 10/13/1993 Findings: 8.600
Chemical: PH (LABORATORY)

Sample Collected: 10/13/1993 Findings: 274.000 MG/L
Chemical: TOTAL ALKALINITY (AS CACO3)

Sample Collected: 10/13/1993 Findings: 282.000 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 10/13/1993 Findings: 238.000 MG/L
Chemical: CALCIUM

Sample Collected: 10/13/1993 Findings: 44.000 MG/L
Chemical: MAGNESIUM

Sample Collected: 10/13/1993 Findings: 80.700 MG/L
Chemical: SODIUM

Sample Collected: 10/13/1993 Findings: 4.300 MG/L
Chemical: POTASSIUM

Sample Collected: 10/13/1993 Findings: 102.000 MG/L
Chemical: CHLORIDE

Sample Collected: 10/13/1993 Findings: 3.000 UG/L
Chemical: ARSENIC

Sample Collected: 10/13/1993 Findings: 185.000 UG/L
Chemical: BORON

Sample Collected: 10/13/1993 Findings: 118.000 UG/L
Chemical: MANGANESE

Sample Collected: 10/13/1993 Findings: 436.000 MG/L
Chemical: TOTAL DISSOLVED SOLIDS

Sample Collected: 10/13/1993 Findings: 1.200 NTU
Chemical: TURBIDITY (LAB)

Sample Collected: 11/16/1993 Findings: 2.000 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 11/16/1993 Findings: 1.000 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 11/16/1993 Findings: 250.000 PC/L
Chemical: TRITIUM COUNTING ERROR

Sample Collected: 11/16/1993 Findings: 1.000 PC/L
Chemical: STRONTIUM-90 COUNTING ERROR

Sample Collected: 11/16/1993 Findings: 21.000 PC/L
Chemical: TOTAL RADON 222 COUNTING ERROR

Sample Collected: 11/16/1993 Findings: .100 PCI/L
Chemical: URANIUM COUNTING ERROR

Sample Collected: 03/10/1994 Findings: 1.000 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 03/10/1994 Findings: 1.000 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 03/10/1994 Findings: 296.000 PC/L
Chemical: TRITIUM COUNTING ERROR

Sample Collected: 03/10/1994 Findings: 1.000 PC/L
Chemical: STRONTIUM-90 COUNTING ERROR

Sample Collected: 03/10/1994 Findings: 21.000 PC/L
Chemical: TOTAL RADON 222 COUNTING ERROR

Sample Collected: 03/10/1994 Findings: .080 PCI/L
Chemical: URANIUM COUNTING ERROR

Sample Collected: 09/29/1994 Findings: 3.000 PC/L
Chemical: GROSS ALPHA COUNTING ERROR

Sample Collected: 09/29/1994 Findings: 1.000 PC/L
Chemical: GROSS BETA COUNTING ERROR

Sample Collected: 09/29/1994 Findings: 191.000 PC/L
Chemical: TRITIUM COUNTING ERROR

Sample Collected: 09/29/1994 Findings: 1.000 PC/L
Chemical: STRONTIUM-90 COUNTING ERROR

Sample Collected: 09/29/1994 Findings: 11.000 PC/L
Chemical: TOTAL RADON 222 COUNTING ERROR

Sample Collected: 09/29/1994 Findings: .030 PCI/L
Chemical: URANIUM COUNTING ERROR

Sample Collected: 09/29/1994 Findings: 22.000 C
Chemical: SOURCE TEMPERATURE C

Sample Collected: 09/29/1994 Findings: 620.000
Chemical: SPECIFIC CONDUCTANCE

Sample Collected: 09/29/1994 Findings: 8.700
Chemical: FIELD PH

Sample Collected: 09/29/1994 Findings: 9.000
Chemical: PH (LABORATORY)

Sample Collected: 09/29/1994 Findings: 193.400 MG/L
Chemical: TOTAL ALKALINITY (AS CACO3)

Sample Collected: 09/29/1994 Findings: 142.400 MG/L
Chemical: BICARBONATE ALKALINITY

Sample Collected: 09/29/1994 Findings: 34.000 MG/L
Chemical: CARBONATE ALKALINITY

Sample Collected: 09/29/1994 Findings: 204.000 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 09/29/1994 Findings: 64.000 MG/L
Chemical: CALCIUM

Sample Collected: 09/29/1994 Findings: 59.700 MG/L
Chemical: SODIUM

Sample Collected: 09/29/1994 Findings: 2.300 MG/L
Chemical: POTASSIUM

Sample Collected: 09/29/1994 Findings: 116.000 MG/L
Chemical: CHLORIDE

Sample Collected: 09/29/1994 Findings: .400 MG/L
Chemical: FLUORIDE (TEMPERATURE DEPENDENT)

Sample Collected: 09/29/1994 Findings: 25.900 MG/L
Chemical: SILICA

Sample Collected: 09/29/1994 Findings: .300 UG/L
Chemical: BORON

Sample Collected: 09/29/1994 Findings: 372.000 MG/L
Chemical: TOTAL DISSOLVED SOLIDS

Sample Collected: 09/29/1994 Findings: 1.200
Chemical: LANGELIER INDEX @ SOURCE TEMP.

Sample Collected: 09/29/1994 Findings: 17.000 MG/L
Chemical: HYDROXIDE ALKALINITY

Sample Collected: 05/16/1995 Findings: 2.400 MG/L
Chemical: NITRATE (AS NO3)

Sample Collected: 09/06/1995 Findings: 71.000 UNITS
Chemical: COLOR

Sample Collected: 09/06/1995 Findings: 502.000
Chemical: SPECIFIC CONDUCTANCE

Sample Collected: 09/06/1995 Findings: 9.300
Chemical: PH (LABORATORY)

Sample Collected: 09/06/1995 Findings: 160.000 MG/L
Chemical: TOTAL ALKALINITY (AS CACO3)

Sample Collected: 09/06/1995 Findings: 108.000 MG/L
Chemical: BICARBONATE ALKALINITY

Sample Collected: 09/06/1995 Findings: 52.000 MG/L
Chemical: CARBONATE ALKALINITY

Sample Collected: 09/06/1995 Findings: .022 UG/L
Chemical: PHOSPHATE

Sample Collected: 09/06/1995 Findings: 159.000 MG/L
Chemical: TOTAL HARDNESS (AS CACO3)

Sample Collected: 09/06/1995 Findings: 24.000 MG/L
Chemical: CALCIUM

Sample Collected: 09/06/1995 Findings: 45.000 MG/L
Chemical: SODIUM

Sample Collected: 09/06/1995 Findings: 1.700 MG/L
Chemical: POTASSIUM

Sample Collected: 09/06/1995 Findings: 61.000 MG/L
Chemical: CHLORIDE

Sample Collected: 09/06/1995 Findings: .400 MG/L
Chemical: FLUORIDE (TEMPERATURE DEPENDENT)

Sample Collected:	09/06/1995	Findings:	24.000 MG/L
Chemical:	SILICA		
Sample Collected:	09/06/1995	Findings:	5.000 UG/L
Chemical:	ARSENIC		
Sample Collected:	09/06/1995	Findings:	280.000 MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	09/06/1995	Findings:	5.400 NTU
Chemical:	TURBIDITY (LAB)		
Sample Collected:	09/06/1995	Findings:	.660 UG/L
Chemical:	CHLOROFORM (THM)		
Sample Collected:	09/06/1995	Findings:	.660 UG/L
Chemical:	TOTAL TRIHALOMETHANES		

GEOCHECK VERSION 2.1
PUBLIC WATER SUPPLY SYSTEM INFORMATION

Searched by Nearest PWS.

PWS SUMMARY:

PWS ID:	CA4100531	PWS Status:	Active	Distance from TP:	1 - 2 Miles
Date Initiated:	June / 1977	Date Deactivated:	Not Reported	Dir relative to TP:	East

PWS Name:
LOG CABIN RANCH
CITY & CO OF SAN FRANCISCO
PESCADERO
LA HONDA, CA 94062

Addressee / Facility:
System Owner/Responsible Party
CITY & CO OF SAN FRANCISCO
375 WOODSIDE AVENUE
SAN FRANCISCO, CA 94127

Facility Latitude:	37 44 18	Facility Longitude:	122 28 06
City Served:	Not Reported		
Treatment Class:	Mixed (treated and untreated)	Population Served:	101 - 500 Persons

PWS currently has or has had major violation(s): Yes

Violations information not reported.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM RECORDS:

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA/NTIS
Telephone: 703-413-0223

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/31/97
Date Made Active at EDR: 04/13/98
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 02/17/98
Elapsed ASTM days: 55
Date of Last EDR Contact: 05/22/98

ERNS: Emergency Response Notification System
Source: EPA/NTIS
Telephone: 202-260-2342

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/30/97
Date Made Active at EDR: 01/02/98
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/04/97
Elapsed ASTM days: 29
Date of Last EDR Contact: 03/05/98

NPL: National Priority List
Source: EPA
Telephone: 703-603-8852

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC).

Date of Government Version: 03/06/98
Date Made Active at EDR: 07/09/98
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 06/09/98
Elapsed ASTM days: 30
Date of Last EDR Contact: 07/02/98

RCRIS: Resource Conservation and Recovery Information System
Source: EPA/NTIS
Telephone: 800-424-9346

Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Date of Government Version: 01/01/98
Date Made Active at EDR: 04/13/98
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 02/17/98
Elapsed ASTM days: 55
Date of Last EDR Contact: 06/05/98

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/15/97
Date Made Active at EDR: 02/02/98
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 01/05/98
Elapsed ASTM days: 28
Date of Last EDR Contact: 05/06/98

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FEDERAL NON-ASTM RECORDS:

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/95
Database Release Frequency: Biennially
Date of Last EDR Contact: 03/24/98
Date of Next Scheduled EDR Contact: 06/22/98

CONSENT: Superfund (CERCLA) Consent Decrees
Source: EPA Regional Offices
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: Varies
Database Release Frequency: Varies
Date of Last EDR Contact: Varies
Date of Next Scheduled EDR Contact: N/A

FINDS: Facility Index System
Source: EPA/NTIS
Telephone: 703-908-2493
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/01/97
Database Release Frequency: Quarterly
Date of Last EDR Contact: 02/26/98
Date of Next Scheduled EDR Contact: 06/22/98

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4526
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/96
Database Release Frequency: Annually
Date of Last EDR Contact: 03/31/98
Date of Next Scheduled EDR Contact: 07/27/98

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/30/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/13/98
Date of Next Scheduled EDR Contact: 07/13/98

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 205-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 05/26/98
Date of Next Scheduled EDR Contact: 08/24/98

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-260-3936
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 09/22/97
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 06/05/98
Date of Next Scheduled EDR Contact: 08/17/98

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 06/15/98
Date of Next Scheduled EDR Contact: 09/14/98

ROD: Records Of Decision
Source: NTIS
Telephone: 703-416-0223
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 03/31/95
Database Release Frequency: Annually
Date of Last EDR Contact: 05/22/98
Date of Next Scheduled EDR Contact: 08/31/98

TRIS: Toxic Chemical Release Inventory System
Source: EPA/NTIS
Telephone: 202-260-1531
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/95
Database Release Frequency: Annually
Date of Last EDR Contact: 06/11/98
Date of Next Scheduled EDR Contact: 06/29/98

TSCA: Toxic Substances Control Act
Source: EPA/NTIS
Telephone: 202-260-1444
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site. USEPA has no current plan to update and/or re-issue this database.

Date of Government Version: 12/31/94
Database Release Frequency: Annually
Date of Last EDR Contact: 04/27/98
Date of Next Scheduled EDR Contact: 07/27/98

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STATE OF CALIFORNIA ASTM RECORDS:

BEP: Bond Expenditure Plan
Source: Department of Health Services
Telephone: 916-255-2118
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/89
Date Made Active at EDR: 08/02/94
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 07/27/94
Elapsed ASTM days: 6
Date of Last EDR Contact: 05/31/94

CAL-SITES (AWP): Annual Workplan
Source: California Environmental Protection Agency
Telephone: 916-323-3400
Known Hazardous Waste Sites. California DTSC's Annual Workplan (AWP), formerly BEP, identifies known hazardous substance sites targeted for cleanup.

Date of Government Version: 11/04/97
Date Made Active at EDR: 12/20/97
Database Release Frequency: Annually
Date of Data Arrival at EDR: 11/21/97
Elapsed ASTM days: 29
Date of Last EDR Contact: 05/04/98

CAL-SITES (ASPIS): Calsites
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database.

Date of Government Version: 01/14/98
Date Made Active at EDR: 04/13/98
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/13/98
Elapsed ASTM days: 31
Date of Last EDR Contact: 06/08/98

CHMIRS: California Hazardous Material Incident Report System
Source: Office of Emergency Services
Telephone: 916-464-3277
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/94
Date Made Active at EDR: 04/24/95
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 03/13/95
Elapsed ASTM days: 42
Date of Last EDR Contact: 06/01/98

CORTESE: Cortese
Source: CAL EPA/Office of Emergency Information
Telephone: 916-327-1848
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 12/31/94
Date Made Active at EDR: 04/04/95
Database Release Frequency: Annually
Date of Data Arrival at EDR: 01/23/95
Elapsed ASTM days: 71
Date of Last EDR Contact: 04/22/98

LUST: Leaking Underground Storage Tank Information System
Source: State Water Resources Control Board
Telephone: 916-445-6532
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 10/01/97
Date Made Active at EDR: 12/23/97
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 11/25/97
Elapsed ASTM days: 28
Date of Last EDR Contact: 05/11/98

NOTIFY 65: Proposition 65
Source: State Water Resources Control Board
Telephone: 916-657-0696
Proposition 65 Notification Records. NOTIFY 65 contains facility notifications about any release which could impact drinking water and thereby expose the public to a potential health risk.

Date of Government Version: 10/21/93
Date Made Active at EDR: 11/19/93
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 11/01/93
Elapsed ASTM days: 18
Date of Last EDR Contact: 05/01/98

SWF/LF (SWIS): Solid Waste Information System
Source: Integrated Waste Management Board
Telephone: 916-255-4035
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inventory of solid waste disposal facilities or landfills. These may be active or inactive facilities or open dumps that failed to meet RCRA Section 2004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 01/01/98
Date Made Active at EDR: 04/13/98
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/17/98
Elapsed ASTM days: 27
Date of Last EDR Contact: 04/27/98

TOXIC PITS: Toxic Pits
Source: State Water Resources Control Board
Telephone: 916-227-4364
Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/95
Date Made Active at EDR: 09/26/95
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 08/30/95
Elapsed ASTM days: 27
Date of Last EDR Contact: 05/12/98

CA UST:

UST: Hazardous Substance Storage Container Database
Source: State Water Resources Control Board
Telephone: 916-227-4408
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/90
Date Made Active at EDR: 02/12/91
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 01/25/91
Elapsed ASTM days: 18
Date of Last EDR Contact: 04/16/98

FID: Facility Inventory Database
Source: California Environmental Protection Agency
Telephone: 916-445-6532
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/94
Date Made Active at EDR: 09/29/95
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 09/05/95
Elapsed ASTM days: 24
Date of Last EDR Contact: 03/30/98

WMUDS/SWAT: Waste Management Unit Database
Source: State Water Resources Control Board
Telephone: 916-227-4448
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 03/11/98
Date Made Active at EDR: 05/21/98
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 04/23/98
Elapsed ASTM days: 28
Date of Last EDR Contact: 06/11/98

STATE OF CALIFORNIA NON-ASTM RECORDS:

AST: Aboveground Petroleum Storage Tank Facilities
Source: State Water Resources Control Board
Telephone: 916-227-4382
Registered Aboveground Storage Tanks.

Date of Government Version: 08/01/97	Date of Last EDR Contact: 05/11/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 08/10/98

HAZMAT: Hazmat Facilities
Source: City of San Jose Fire Department
Telephone: 408-277-4659

Date of Government Version: 11/21/97	Date of Last EDR Contact: 05/26/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 08/24/98

HAZNET: Hazardous Waste Information System
Source: California Environmental Protection Agency
Telephone: 916-324-1781
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/95	Date of Last EDR Contact: 04/21/98
Database Release Frequency: Annually	Date of Next Scheduled EDR Contact: 07/20/98

SOUTH BAY: South Bay Site Management System
Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Groundwater pollution cases in the Santa Clara Valley where the regulatory lead is the San Francisco Bay Regional Water Quality Control Board.

Date of Government Version: 09/01/96	Date of Last EDR Contact: 03/19/98
Database Release Frequency: Annually	Date of Next Scheduled EDR Contact: 06/15/98

WDS: Waste Discharge System
Source: State Water Resources Control Board
Telephone: 916-657-1571
Sites which have been issued waste discharge requirements.

Date of Government Version: 12/01/97	Date of Last EDR Contact: 05/26/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 08/24/98

CALIFORNIA COUNTY RECORDS

ALAMEDA COUNTY:

Underground Tanks
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 10/01/97
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/08/98
Date of Next Scheduled EDR Contact: 08/03/98

Local Oversight Program Listing of UGT Cleanup Sites
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 10/01/97
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/08/98
Date of Next Scheduled EDR Contact: 08/03/98

CONTRA COSTA COUNTY:

SL: Site List
Source: Contra Costa Health Services Department
Telephone: 510-646-2286
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 05/02/97
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/11/98
Date of Next Scheduled EDR Contact: 08/10/98

KERN COUNTY:

UST: Sites & Tanks Listing
Source: Kern County Environment Health Services Department
Telephone: 805-862-8700
Kern County Sites and Tanks Listing.

Date of Government Version: 01/28/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/13/98
Date of Next Scheduled EDR Contact: 07/13/98

LOS ANGELES COUNTY:

HMS: Street Number List
Source: Department of Public Works
Telephone: 626-458-3517
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 09/30/97
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/13/98
Date of Next Scheduled EDR Contact: 07/13/98

SWF/LF: List of Solid Waste Facilities
Source: La County Department of Public Works
Telephone: 818-458-5185

Date of Government Version: 01/31/96
Database Release Frequency: Annually
Date of Last EDR Contact: 06/01/98
Date of Next Scheduled EDR Contact: 08/24/98

Site Mitigation List
Source: Community Health Services
Telephone: 213-890-7806
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/20/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 05/27/98
Date of Next Scheduled EDR Contact: 08/24/98

MARIN COUNTY:

UST Sites
Source: Public Works Department Waste Management
Telephone: 415-499-6647
Currently permitted USTs in Marin County.

Date of Government Version: 12/01/97
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/11/98
Date of Next Scheduled EDR Contact: 08/10/98

NAPA COUNTY:

LUST: Sites With Reported Contamination
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 10/27/97
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/23/98
Date of Next Scheduled EDR Contact: 06/22/98

UST: Closed and Operating Underground Storage Tank Sites
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 10/09/96
Database Release Frequency: Annually
Date of Last EDR Contact: 03/24/98
Date of Next Scheduled EDR Contact: 06/22/98

ORANGE COUNTY:

List of Industrial Site Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Petroleum and non-petroleum spills.

Date of Government Version: 03/13/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/15/98
Date of Next Scheduled EDR Contact: 09/14/98

LUST: List of Underground Storage Tank Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 03/02/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/15/98
Date of Next Scheduled EDR Contact: 09/14/98

UST: List of Underground Storage Tank Facilities
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 02/24/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/15/98
Date of Next Scheduled EDR Contact: 09/14/98

PLACER COUNTY:

MS: Master List of Facilities
Source: Placer County Health and Human Services
Telephone: 530-889-7335
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 01/13/98	Date of Last EDR Contact: 03/30/98
Database Release Frequency: Semi-Annually	Date of Next Scheduled EDR Contact: 06/29/98

RIVERSIDE COUNTY:

LUST: Listing of Underground Tank Cleanup Sites
Source: Department of Public Health
Telephone: 909-358-5055
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 01/21/98	Date of Last EDR Contact: 04/27/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 07/27/98

UST: Tank List
Source: Health Services Agency
Telephone: 909-358-5055

Date of Government Version: 01/14/98	Date of Last EDR Contact: 04/27/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 07/27/98

SACRAMENTO COUNTY:

Toxisite List
Source: Sacramento County Environmental Management
Telephone: 916-386-6706

Date of Government Version: 02/02/98	Date of Last EDR Contact: 05/15/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 08/10/98

ML: Regulatory Compliance Master List
Source: Sacramento County Environmental Management
Telephone: 916-386-6706
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 01/06/98	Date of Last EDR Contact: 03/16/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 08/10/98

SAN BERNARDINO COUNTY:

DEHS Permit System Print-Out By Location
Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 10/01/97	Date of Last EDR Contact: 06/15/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 09/14/98

SAN DIEGO COUNTY:

SWF/LF: Solid Waste Facilities
Source: Department of Health Services
Telephone: 619-338-2209
San Diego County Solid Waste Facilities.

Date of Government Version: 11/08/95
Database Release Frequency: Annually
Date of Last EDR Contact: 06/05/98
Date of Next Scheduled EDR Contact: 08/31/98

HMMD: Hazardous Materials Management Division Database
Source: Hazardous Materials Management Division
Telephone: 619-338-2268
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 01/05/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/13/98
Date of Next Scheduled EDR Contact: 07/13/98

SAN FRANCISCO COUNTY:

LUST: Local Oversite Facilities
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920

Date of Government Version: 03/19/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 05/18/98
Date of Next Scheduled EDR Contact: 08/17/98

Underground Storage Tank Information
Source: Department of Public Health
Telephone: 415-252-3920

Date of Government Version: 03/19/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 05/18/98
Date of Next Scheduled EDR Contact: 08/17/98

SAN MATEO COUNTY:

Business Inventory
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 01/01/97
Database Release Frequency: Annually
Date of Last EDR Contact: 05/18/98
Date of Next Scheduled EDR Contact: 08/17/98

LUST: Fuel Leak List
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921

Date of Government Version: 01/12/98
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/18/98
Date of Next Scheduled EDR Contact: 08/17/98

SANTA CLARA COUNTY:

LUST: Fuel Leak Site Activity Report
Source: Santa Clara Valley Water District
Telephone: 408-927-0710

Date of Government Version: 01/15/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/06/98
Date of Next Scheduled EDR Contact: 07/06/98

SOLANO COUNTY:

LUST: Leaking Undergroung Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 10/27/97
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/23/98
Date of Next Scheduled EDR Contact: 06/22/98

UST: Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 12/16/97
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/16/98
Date of Next Scheduled EDR Contact: 06/22/98

SONOMA COUNTY:

LUST Sites
Source: Department of Health Services
Telephone: 707-525-6565

Date of Government Version: 01/09/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/23/98
Date of Next Scheduled EDR Contact: 06/22/98

SUTTER COUNTY:

UST: Underground Storage Tanks
Source: Sutter County Department of Agriculture
Telephone: 530-741-7504

Date of Government Version: 09/18/97
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 06/01/98
Date of Next Scheduled EDR Contact: 07/13/98

VENTURA COUNTY:

BWT: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 09/25/97
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/23/98
Date of Next Scheduled EDR Contact: 06/22/98

LUST: Listing of Underground Tank Cleanup Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 12/31/97	Date of Last EDR Contact: 03/23/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 06/22/98

UST: Underground Tank Closed Sites List
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 12/31/97	Date of Last EDR Contact: 03/23/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 06/22/98

SWF/LF: Inventory of Illegal Abandoned and Inactive Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 06/01/97	Date of Last EDR Contact: 06/02/98
Database Release Frequency: Annually	Date of Next Scheduled EDR Contact: 08/31/98

California Regional Water Quality Control Board (RWQCB) LUST Records

LUST REG 1: Active Toxic Site Investigation
Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-576-2220

Date of Government Version: 02/11/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/01/98
Date of Next Scheduled EDR Contact: 08/31/98

LUST REG 2: Fuel Leak List
Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457

Date of Government Version: 01/22/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/24/98
Date of Next Scheduled EDR Contact: 07/20/98

LUST REG 3: LUSTIS Database
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147

Date of Government Version: 08/20/97
Database Release Frequency: Quarterly
Date of Last EDR Contact: 05/26/98
Date of Next Scheduled EDR Contact: 08/24/98

LUST REG 4: Underground Storage Tank Leak List
Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-266-7544

Date of Government Version: 01/14/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/06/98
Date of Next Scheduled EDR Contact: 07/06/98

LUST REG 5: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-255-3125

Date of Government Version: 01/21/98
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/13/98
Date of Next Scheduled EDR Contact: 07/13/98

LUST REG 6L: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 916-542-5424

Date of Government Version: 12/01/97
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/14/98
Date of Next Scheduled EDR Contact: 07/13/98

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-346-7491

Date of Government Version: 11/12/97
Database Release Frequency: Quarterly
Date of Last EDR Contact: 05/11/98
Date of Next Scheduled EDR Contact: 08/03/98

LUST REG 7: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-346-7491

Date of Government Version: 11/12/97
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 06/01/98
Date of Next Scheduled EDR Contact: 08/31/98

LUST REG 8: (LUSTIS) Leaking Underground Storage Tanks
Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4498

Date of Government Version: 01/02/98
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/17/98
Date of Next Scheduled EDR Contact: 07/13/98

LUST REG 9: Leaking Underground Storage Tank Report
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 619-467-2952

Date of Government Version: 12/23/97
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/06/98
Date of Next Scheduled EDR Contact: 07/06/98

California Regional Water Quality Control Board (RWQCB) SLIC Records

SLIC REG 1: Active Toxic Site Investigations
Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220

Date of Government Version: 03/09/98	Date of Last EDR Contact: 06/01/98
Database Release Frequency: Semi-Annually	Date of Next Scheduled EDR Contact: 08/31/98

SLIC REG 2: North and South Bay Slic Report
Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 01/22/98	Date of Last EDR Contact: 04/24/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 07/20/98

SLIC REG 3: SLIC Data
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 12/12/97	Date of Last EDR Contact: 05/26/98
Database Release Frequency: Semi-Annually	Date of Next Scheduled EDR Contact: 08/24/98

SLIC REG 4: SLIC Sites
Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-266-7544
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 01/20/98	Date of Last EDR Contact: 04/06/98
Database Release Frequency: Quarterly	Date of Next Scheduled EDR Contact: 07/06/98

SLIC REG 5: SLIC List
Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-855-3075
Unregulated sites that impact groundwater or have the potential to impact groundwater.

Date of Government Version: 10/01/97	Date of Last EDR Contact: 02/25/98
Database Release Frequency: Semi-Annually	Date of Next Scheduled EDR Contact: 07/13/98

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583

Date of Government Version: 09/23/97	Date of Last EDR Contact: 04/14/98
Database Release Frequency: Semi-Annually	Date of Next Scheduled EDR Contact: 07/13/98

SLIC REG 8: SLIC List
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-3298

Date of Government Version: 10/31/97	Date of Last EDR Contact: 04/16/98
Database Release Frequency: Semi-Annually	Date of Next Scheduled EDR Contact: 07/13/98

SLIC REG 9: WDS NURD List
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 619-467-2980

Date of Government Version: 11/21/96	Date of Last EDR Contact: 06/15/98
Database Release Frequency: Annually	Date of Next Scheduled EDR Contact: 09/07/98

Historical and Other Database(s)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

Disclaimer Provided by Real Property Scan, Inc.

The information contained in this report has predominantly been obtained from publicly available sources produced by entities other than Real Property Scan. While reasonable steps have been taken to insure the accuracy of this report, Real Property Scan does not guarantee the accuracy of this report. Any liability on the part of Real Property Scan is strictly limited to a refund of the amount paid. No claim is made for the actual existence of toxins at any site. This report does not constitute a legal opinion.

DELISTED NPL: NPL Deletions
Source: EPA
Telephone: 703-603-8769
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 03/06/98	Date of Data Arrival at EDR: 06/09/98
Date Made Active at EDR: 07/09/98	Elapsed ASTM days: 30
Database Release Frequency: Semi-Annually	Date of Last EDR Contact: 07/02/98

NFRAP: No Further Remedial Action Planned
Source: EPA/NTIS
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 12/31/97	Date of Data Arrival at EDR: 02/17/98
Date Made Active at EDR: 04/13/98	Elapsed ASTM days: 55
Database Release Frequency: Quarterly	Date of Last EDR Contact: 05/22/98

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-260-2805
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-260-2805
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SWDIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Area Radon Information: The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

Oil/Gas Pipelines/Electrical Transmission Lines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines and electrical transmission lines.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

USGS Water Wells: In November 1971 the United States Geological Survey (USGS) implemented a national water resource information tracking system. This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on more than 900,000 wells, springs, and other sources of groundwater.

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1996 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in March 1997 from the U.S. Fish and Wildlife Service.

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Water Dams: National Inventory of Dams
Source: Federal Emergency Management Agency
Telephone: 202-646-2801
National computer database of more than 74,000 dams maintained by the Federal Emergency Management Agency.

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

Appendix
E

Appendix E

California Regional Water Quality Control Board

San Francisco Bay Basin

Water Quality Control Plan

June 21, 1995

Excerpt of Chapter 2: Beneficial Uses

2

BENEFICIAL USES

INTRODUCTION

State policy for water quality control in California is directed toward achieving the highest water quality consistent with maximum benefit to the people of the state. Aquatic ecosystems and underground aquifers provide many different benefits to the people of the state. The beneficial uses described in detail in this chapter define the resources, services, and qualities of these aquatic systems that are the ultimate goals of protecting and achieving high water quality. The Regional Board is charged with protecting all these uses from pollution and nuisance that may occur as aresult of waste discharges in the region. Beneficial uses of surface waters, groundwaters, marshes, and mudflats presented here serve as a basis for establishing water quality objectives and discharge prohibitions to attain this goal.

DEFINITIONS OF BENEFICIAL USES

The following definitions for beneficial uses are applicable throughout the entire state. A brief description of the most important water quality requirements for each beneficial use follows each definition (in alphabetical order by abbreviation).

(COLD) COLD FRESHWATER HABITAT

Uses of water that support cold water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats,vegetation, fish, or wildlife, including invertebrates.

Cold freshwater habitats generally support trout and may support the anadromous salmon and steelhead fisheries as well. Cold water habitats are commonly well-oxygenated. Life within these waters is relatively intolerant to environmental stresses. Often, soft waters feed cold water habitats. These waters render fish more susceptible to toxic metals, such as copper, because of their lower buffering capacity.

(MUN) MUNICIPAL AND DOMESTIC SUPPLY

Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply.

The principal issues involving municipal water supply quality are (1) protection of public health; (2)aesthetic acceptability of the water; and (3) the economic impacts associated with treatment- or quality-related damages.

The health aspects broadly relate to: direct disease transmission, such as the possibility of contracting typhoid fever or cholera from contaminated water; toxic effects, such as links between nitrate and methemoglobinemia (blue babies); and increased susceptibility to disease, such as links between halogenated organic compounds and cancer.

Aesthetic acceptance varies widely depending on the nature of the supply source to which people have become accustomed. However, the parameters of general concern are excessive hardness, unpleasant odor or taste, turbidity, and color. In each case, treatment can improve acceptability although its cost may not be economically justified when alternative water supply sources of suitable quality are available.

Published water quality objectives give limits for known health-related constituents and most properties affecting public acceptance. These objectives for drinking water include the U.S. Environmental Protection Agency Drinking Water Standards and the California State Department of Health Services criteria.

(REC1) WATER CONTACT RECREATION

Uses of water for recreational activities involving body contact with water where ingestion of water is

reasonably possible. These uses include, but are not limited to, swimming, wading, waterskiing, skin and scuba diving, surfing, whitewater activities, fishing, and uses of natural hot springs.

Water contact implies a risk of waterborne disease transmission and involves human health; accordingly, criteria required to protect this use are more stringent than those for more casual water-oriented recreation.

Excessive algal growth has reduced the value of shoreline recreation areas in some cases, particularly for swimming. Where algal growths exist in nuisance proportions, particularly bluegreen algae, all recreational water uses, including fishing, tend to suffer.

One criterion to protect the aesthetic quality of waters used for recreation from excessive algal growth is based on chlorophyll a.

(REC2) NONCONTACT WATER RECREATION

Uses of water for recreational activities involving proximity to water, but not normally involving contact with water where water ingestion is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities .

Water quality considerations relevant to noncontact water recreation, such as hiking, camping, or boating, and those activities related to tide pool or other nature studies require protection of habitats and aesthetic features. In some cases, preservation of a natural wilderness condition is justified, particularly when nature study is a major dedicated use.

One criterion to protect the aesthetic quality of waters used for recreation from excessive algal growth is based on chlorophyll a.

(SPWN) FISH SPAWNING

Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

Dissolved oxygen levels in spawning areas should ideally approach saturation levels. Free movement of water is essential to maintain well-oxygenated conditions around eggs deposited in sediments. Water temperature, size distribution and organic content of sediments, water depth, and current velocity are also important determinants of spawning area adequacy.

(WARM) WARM FRESHWATER HABITAT

Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

The warm freshwater habitats supporting bass, bluegill, perch, and other panfish are generally lakes and reservoirs, although some minor streams will serve this purpose where stream flow is sufficient to sustain the fishery. The habitat is also important to a variety of nonfish species, such as frogs, crayfish, and insects, which provide food for fish and small mammals. This habitat is less sensitive to environmental changes, but more diverse than the cold freshwater habitat, and natural fluctuations in temperature, dissolved oxygen, pH, and turbidity are usually greater.

Appendix
F

Appendix F

California Regional Water Quality Control Board
San Francisco Bay Basin
Water Quality Control Plan
June 21, 1995
Excerpt of Chapter 3: Water Quality Objectives

3

WATER QUALITY OBJECTIVES

INTRODUCTION

The overall goals of water quality regulation are to protect and maintain thriving aquatic ecosystems and the resources those systems provide to society and to accomplish these in an economically and socially sound manner. California's regulatory framework uses water quality objectives both to define appropriate levels of environmental quality and to control activities that can adversely affect aquatic systems.

OBJECTIVES FOR SURFCE WATERS

The following objectives apply to all surface waters within the region, except the Pacific Ocean.

BACTERIA

Table 3-l provides a summary of the bacterial water quality objectives and identifies the sources of those objectives. Table 3-2 summarizes U.S. EPA's water quality criteria for water contact recreation based on the frequency of use a particular area receives. These criteria will be used to differentiate between pollution sources or to supplement objectives for water contact recreation.

BIOACCUMULATION

Many pollutants can accumulate on particles, in sediment, or bioaccumulate in fish and other aquatic organisms. Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered.

BIOSTIMULATORY SUBSTANCES

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses. Changes in chlorophyll a and associated phytoplankton communities follow complex dynamics that are sometimes associated with a discharge of biostimulatory substances. Irregular and extreme levels of chlorophyll a or phytoplankton blooms may indicate exceedance of this objective and require investigation.

COLOR

Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

DISSOLVED OXYGEN

For nontidal waters, the following objectives shall apply:

Waters designated as:

Cold water habitat.	7.0 mg/l minimum
Warm water habitat.	5.0 mg/l minimum

The median dissolved oxygen concentration for any three consecutive months shall not be less than 80 percent of the dissolved oxygen content at saturation.

Dissolved oxygen is a general index of the state of the health of receiving waters. Although minimum concentrations of 5 mg/l and 7 mg/l are frequently used as objectives to protect fish life, higher concentrations are generally desirable to protect sensitive aquatic forms. In areas unaffected by waste discharges, a level of about 85 percent of oxygen saturation exists. A three-month median objective of 80 percent of oxygen saturation allows for some degradation from this level, but still requires a consistently high oxygen content in the receiving water.

FLOATING MATERIAL

Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations

that cause nuisance or adversely affect beneficial uses.

OIL AND GREASE
Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.

POPULATION AND COMMUNITY ECOLOGY
All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce significant alterations in population or community ecology or receiving water biota. In addition, the health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ significantly from those for the same waters in areas unaffected by controllable water quality factors.

pH
The pH shall not be depressed below 6.5 nor raised above 8.5. This encompasses the pH range usually found in waters within the basin. Controllable water quality factors shall not cause changes greater than 0.5 units in normal ambient pH levels.

SALINITY
Controllable water quality factors shall not increase the total dissolved solids or salinity of waters of the state so as to adversely affect beneficial uses, particularly fish migration and estuarine habitat.

SEDIMENT
The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Controllable water quality factors shall not cause a detrimental increase in the concentrations of toxic pollutants in sediments or aquatic life.

SETTLEABLE MATERIAL
Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses.

SUSPENDED MATERIAL
Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

SULFIDE
All water shall be free from dissolved sulfide concentrations above natural background levels. Sulfide occurs in Bay muds as a result of bacterial action on organic matter in an anaerobic environment.

Concentrations of only a few hundredths of a milligram per liter can cause a noticeable odor or be toxic to aquatic life. Violation of the sulfide objective will reflect violation of dissolved oxygen objectives as sulfides cannot exist to a significant degree in an oxygenated environment.

TASTES AND ODORS
Waters shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, that cause nuisance, or that adversely affect beneficial uses.

TEMPERATURE
Temperature objectives for enclosed bays and estuaries are as specified in the “Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California,” including any revisions to the plan.

In addition, the following temperature objectives apply to surface waters:

- The natural receiving water temperature of inland surface waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not

adversely affect beneficial uses.

- The temperature of any cold or warm freshwater habitat shall not be increased by more than 5°F (2.8°C) above natural receiving water temperature.

TOXICITY

All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms. Detrimental responses include, but are not limited to, decreased growth rate and decreased reproductive success of resident or indicator species. There shall be no acute toxicity in ambient waters. Acute toxicity is defined as a median of less than 90 percent survival, or less than 70 percent survival, 10 percent of the time, of test organisms in a 96-hour static or continuous flow test.

There shall be no chronic toxicity in ambient waters. Chronic toxicity is a detrimental biological effect on growth rate, reproduction, fertilization success, larval development, population abundance, community composition, or any other relevant measure of the health of an organism, population, or community. Chronic toxicity generally results from exposures to pollutants exceeding 96 hours. However, chronic toxicity may also be detected through short-term exposure of critical life stages of organisms.

As a minimum, compliance will be evaluated using the bioassay requirements contained in Chapter 4.

The health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ significantly from those for the same waters in areas unaffected by controllable water quality factors.

TURBIDITY

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU.

UN-IONIZED AMMONIA

The discharge of wastes shall not cause receiving waters to contain concentrations of un-ionized ammonia in excess of the following limits (in mg/l as N):

Annual Median	0.025
Maximum, Central Bay (as depicted in Figure 2-5) and upstream	0.16
Maximum, Lower Bay (as depicted in Figures 2-6 and 2-7)	0.4

The intent of this objective is to protect against the chronic toxic effects of ammonia in the receiving waters. An ammonia objective is needed for the following reasons:

- Ammonia (specifically un-ionized ammonia) is a demonstrated toxicant. Ammonia is generally accepted as one of the principle toxicants in municipal waste discharges. Some industries also discharge significant quantities of ammonia.
- Exceptions to the effluent toxicity limitations in Chapter 4 of the Plan allow for the discharge of ammonia in toxic amounts. In most instances, ammonia will be diluted or degraded to a nontoxic state fairly rapidly. However, this does not occur in all cases, the South Bay being a notable example. The ammonia limit is recommended in order to preclude any build up of ammonia in the receiving water.

OBJECTIVES FOR SPECIFIC CHEMICAL CONSTITUENTS

Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use. Water quality objectives for selected toxic pollutants developed in 1986 for surface waters are given in Tables 3-3 and 3-4.

CONSTITUENTS OF CONCERN FOR MUNICIPAL AND AGRICULTURAL WATER SUPPLIES

At a minimum, surface waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of constituents in excess of the maximum (MCLs) or secondary maximum contaminant

levels (SMCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Table 64449-A (SMCLs-Consumer Acceptance Limits) and 64449-B (SMCLs-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. Table 3-5 contains water quality objectives for municipal supply, including the MCLs contained in various sections of Title 22 as of the adoption of this plan.

RADIOACTIVITY

Radionuclides shall not be present in concentrations that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. Waters designated for use as domestic or municipal supply shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations, which is incorporated by reference into this Plan. This incorporation is prospective, including future changes to the incorporated provisions as the changes take effect (see Table 3-5).

Appendix
G

Appendix G
Water Quality Data

San Francisco Water Department

Laboratory Section

Weekly Report of Laboratory Examinations

North Lake and South Lake

1998

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 9-JAN-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	30 : 30	:	:	49								
L. Merced N. Surf.	1	50 : 50	:	:	51		8.4	284	93	270	20.0	830	
L. Merced S. Surf.	1	80 : 80	:	:	51		8.2	184	64	178	15.0	570	
Lower C.S. Outlet	1	50 : 50	:	:	54		7.8	46	8	46	1.3	134	
Lower C.S. Surf.	1	14 : 14	:	:	50		7.8	44	8	46	1.0	134	
Pilarcitos Surf.	1	110 : 110	:	:	55		7.7	56	19	58	63.0	185	
San Andreas Out.	1	4 : 4	:	:	52		7.9	52	12	54	0.5	159	
San Antonio Out.	1	23 : 23	:	:	37		7.9	96	27	112	2.0	337	
San Antonio Surf.	1	80 : 80	:	:	50		8.0	96	27	112	1.8	337	
Stone Dam Surf.	1	1300 : 1300	:	:	55		7.7	84	23	106	4.0	271	
Sunol Filt	1	23 : 23	:	:	60		7.6	468	32	170	0.1	568	
SVWTP Raw	1	7 : 7	:	:	52		8.0	98	12	102	1.6	262	
Tesla Portal	1	22 : 22	:	:	52		9.4	11	3	9	0.2	25	

Report generated by: Date: 1/14/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Date: 1-14-98
Secondary review by:____ Date:______

Approved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 6-FEB-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	500 : 500	:	:	55								
L. Merced N. Surf.	1	2400 : 2400	:	:	55		8.2	260	85	246	16.0	754	
L. Merced S. Surf.	1	800 : 800	:	:	55		8.2	174	59	164	9.4	531	
Lower C.S. Outlet	1	17 : 17	:	:	54		7.8	48	9	52	13.0	144	
Lower C.S. Surf.	1	110 : 110	:	:	49		7.8	46	9	50	8.7	138	
Pilarcitos Surf.	1	1300 : 1300	:	:	55		7.6	44	15	46	10.0	148	
San Andreas Out.	1	4 : 4	:	:	58		7.8	50	14	54	3.2	157	
San Antonio Out.	1	10 : 10	:	:	55		8.1	96	25	112	7.8	327	
San Antonio Surf.	1	500 : 500	:	:	52		8.1	90	23	104	8.9	307	
Stone Dam Surf.	1	16000 : 16000	:	:	55		7.2	70	11	72	140	182	
Sunol Filt	1	1700 : 1700	:	:	60		7.4	134	6	144	7.8	402	
SVWTP Raw	1	170 : 170	:	:			7.8	50	14	54	3.2	157	
Tesla Portal	1	50 : 50	:	:	54		9.6	14	3	10	0.3	33	

Report generated by: Date: 2/11/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Date: 2-11-98
Secondary review by:____ Date:______

Approved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 6-MAR-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	500 : 500	:	:									
L. Merced N. Surf.	1	300 : 300	:	:	55		8.4	240	80	252	8.7	704	
L. Merced S. Surf.	1	130 : 130	:	:	55		8.3	160	58	160	8.3	503	
Lower C.S. Outlet	1	230 : 230	:	:	54		7.7	52	10	58	28.0	159	
Lower C.S. Surf.	1	220 : 220	:	:	49		7.7	54	10	60	29.0	157	
Pilarcitos Surf.	1	170 : 170	:	:	55		7.6	44	14	44	21.0	147	
San Andreas Out.	1	17 : 17	:	:	58		7.9	50	12	52	6.2	157	
San Antonio Out.	1	230 : 230	:	:	56		8.1	92	21	106	36.0	283	
San Antonio Surf.	1	170 : 170	:	:	54		8.2	92	21	106	31.0	291	
Stone Dam Surf.	1	1300 : 1300	:	:	55		7.7	58	18	62	19.0	187	
Sunol Filt	1	30 : 30	:	:	54		7.7	126	18	146	1.7	365	
SVWTP Raw	1	140 : 140	:	:	58		7.9	72	3	78	54.0	183	
Tesla Portal	1	13 : 13	:	:	53		9.6	18	3	16	0.3	43	

Report generated by: Amc Date: 3/12/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Amc Date: 3-12-98
Secondary review by:____ Date:______

Approved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 3-APR-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	80 : 80	:	:									
L. Merced N. Surf.	1	3000 : 3000	:	:	56		8.4	228	81	232	12.1	705	
L. Merced S. Surf.	1	110 : 110	:	:	55		8.2	168	60	162	10.2	523	
Lower C.S. Outlet	1	17 : 17	:	:	60		8.0	60	14	64	18.0	168	
Lower C.S. Surf.	1	13 : 13	:	:	48		7.9	60	14	66	15.0	171	
Pilarcitos Surf.	1	4 : 4	:	:	55		7.9	46	15	46	6.5	154	
San Andreas Out.	1	<2 : <2	:	:	60		7.8	50	12	52	2.6	156	
San Antonio Out.	1	50 : 50	:	:	54		7.9	86	7	84	30.4	197	
San Antonio Surf.	1	130 : 130	:	:	56		8.5	100	22	104	8.3	303	
Stone Dam Surf.	1	80 : 80	:	:	55		7.8	92	27	104	1.2	290	
Sunol Filt	1	<2 : <2	:	:	58		7.5	156	21	180	0.2	448	
SVWTP Raw	1	30 : 30	:	:	58		7.8	76	6	82	30.0	196	
Tesla Portal	1	8 : 8	:	:	50		9.1	16	3	14	0.3	35	

Report generated by: Date: 4/ 8/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Date: 4-8-98
Secondary review by:____ Date:______

Approved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 1-MAY-98

Location	No.	TCol.MPN		Fcol.MPN		HPC		Temp	Cl2	pH	Alk.	Cl-	Hard.	Turb.	Cond.	DO
	Anl.	min	max	min	max	min	max	F.	mg/l		mg/l	mg/l	mg/l	NTU	um/cm	mg/l
Calaveras Surf.	1	2	2					61								
L. Merced N. Surf.	1	30	30							8.7	250	84	240	20.0	684	
L. Merced S. Surf.	1	30	30							8.4	168	63	166	13.0	522	
Lower C.S. Outlet	1	<2	<2					62		8.0	60	13	64	11.0	170	
Lower C.S. Surf.	1	9	9					52		8.0	60	13	64	11.0	172	
Pilarcitos Surf.	1	4	4					55		8.6	48	15	52	2.9	152	
San Andreas Out.	1	2	2					65		8.0	58	12	60	3.8	168	
San Antonio Out.	1	7	7					58		8.0	96	18	100	17.0	272	
San Antonio Surf.	1	90	90					66		8.7	100	20	110	1.6	297	
Stone Dam Surf.	1	500	500					55		8.0	60	21	64	2.3	200	
Sunol Filt	1	4	4					62		7.3	146	20	170	0.2	477	
SVWTP Raw	1	7	7					56		8.0	78	7	80	26.0	199	
Tesla Portal	1	12	12					52		9.2	17	3	15	0.3	35	

Report generated by: Date: 5/ 6/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Date: 5/6/98
Secondary review by:____ Date:______

Approved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 5-JUN-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	26 : 26	:	:	65								
L. Merced N. Surf.	1	30 : 30	:	:	68		9.0	249	80	240	22.0	682	
L. Merced S. Surf.	1	60 : 60	:	:	68		9.0	169	60	169	25.0	671	
Lower C.S. Outlet	1	30 : 30	:	:	64		8.1	58	12	62	3.7	171	
Lower C.S. Surf.	1	130 : 130	:	:	63		8.3	58	12	62	3.6	172	
Pilarcitos Surf.	1	50 : 50	:	:	55		8.0	50	23	50	1.2	153	
San Andreas Out.	1	4 : 4	:	:	64		7.9	56	12	60	2.0	168	
San Antonio Out.	1	2 : 2	:	:	58		7.8	96	20	110	11.0	292	
San Antonio Surf.	1	300 : 300	:	:	64		8.2	104	20	116	4.2	303	
Stone Dam Surf.	1	300 : 300	:	:	55		7.6	89	16	100	1.7	263	
Sunol Filt	1	90 : 90	:	:	62		7.5	160	24	208	0.2	480	
SVWTP Raw	1	4 : 4	:	:	58		7.8	84	10	90	13.9	230	
Tesla Portal	1	<2 : <2	:	:	52		9.5	16	3	12	0.4	34	

Report generated by: Dhe Date: 6/10/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Dhe Date: 6/10/98
Secondary review by:____ Date:______

Approved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 3-JUL-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	<2 : <2	:	:	73								
L. Merced N. Surf.	1	13 : 13	:	:	68		8.6	252	81	240	21.0	721	
L. Merced S. Surf.	1	500 : 500	:	:	66		8.2	176	62	170	7.0	547	
Lower C.S. Outlet	1	30 : 30	:	:	60		8.3	58	12	66	2.4	174	
Lower C.S. Surf.	1	170 : 170	:	:	62		8.5	58	12	66	2.3	177	
Pilarcitos Surf.	1	26 : 26	:	:	58		8.2	50	17	50	0.7	164	
San Antonio Out.	1	2 : 2	:	:	64		7.8	102	20	116	13.0	319	
San Antonio Surf.	1	15 : 15	:	:	67		8.5	106	20	114	2.2	316	
Stone Dam Surf.	1	27 : 27	:	:	58		7.7	88	23	94	0.8	258	
Sunol Filt	1	4 : 4	:	:	60		7.4	164	24	200	0.1	507	
SVWTP Raw	1	<2 : <2	:	:	56		7.8	80	5	84	17.0	198	
Tesla Portal	1	33 : 33	:	:	54		9.0	16	3	12	0.9	87	

Report generated by: Date: 7/ 9/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Date: 7/9/98
Secondary review by:____ Date:______

Approved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 7-AUG-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	<2 : <2	:	:	78								
L. Merced N. Surf.	1	230 : 230	:	:	70		9.0	256	86	246	32.0	729	
L. Merced S. Surf.	1	2400 : 2400	:	:	70		8.7	182	65	180	15.0	550	
Lower C.S. Outlet	1	23 : 23	:	:	72		8.2	60	13	70	1.0	186	
*Lower C.S. Surf.	1	— : —	:	:	67		8.4	64	13	68	1.0	190	
Pilarcitos Surf.	1	4 : 4	:	:			8.1	56	18	54	0.5	166	
San Andreas Out.	1	<2 : <2	:	:	72		7.8	58	13	70	0.4	179	
San Antonio Out.	1	<2 : <2	:	:	76		7.4	120	21	118	29.0	331	
San Antonio Surf.	1	4 : 4	:	:	77		8.6	110	21	122	1.5	326	
Stone Dam Surf.	1	300 : 300	:	:			7.9	72	22	74	0.5	216	
Sunol Filt	1	140 : 140	:	:	75		7.3	170	28	230	0.2	544	
SVWTP Raw	1	4 : 4	:	:	60		7.8	86	7	88	6.0	214	
Tesla Portal	1	4 : 4	:	:	62		9.6	14	3	12	0.6	28	

No bacti data for LCS surf this week. Analyst error

Report generated by: Date: 8/13/98
Field data verified by:____ Date:____
Chemistry data verified by: PL Date: 8/13/98
Bacteriological data verified by: Date: 8/13/98
Secondary review by:____ Date:____

Approved by:____ Date:____

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 4-SEP-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	2 : 2	:	:	77								
L. Merced N. Surf.	1	50 : 50	:	:	68		8.6	266	86	244	26.0	758	
L. Merced S. Surf.	1	140 : 140	:	:	66		8.4	190	65	180	14.0	570	
Lower C.S. Outlet	1	50 : 50	:	:	68		8.2	62	12	66	0.6	180	
Lower C.S. Surf.	1	11 : 11	:	:	67		8.4	62	12	68	0.6	186	
Pilarcitos Surf.	1	4 : 4	:	:	58		8.1	54	18	54	0.5	173	
San Andreas Out.	1	2 : 2	:	:	70		7.8	62	12	66	0.4	184	
San Antonio Out.	1	<2 : <2	:	:	72		7.4	104	21	108	54.0	312	
San Antonio Surf.	1	8 : 8	:	:	76		8.8	114	21	128	1.1	326	
Stone Dam Surf.	1	110 : 110	:	:	58		7.8	66	20	70	0.6	206	
Sunol Filt	1	110 : 110	:	:	70		7.5	168	28	196	0.2	527	
SVWTP Raw	1	4 : 4	:	:	63		7.9	94	6	94	2.1	245	
Tesla Portal	1	4 : 4	:	:	62		9.6	14	3	12	0.4	29	

Report generated by: Date: 9/ 9/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Date: 9/9/98
Secondary review by:____ Date:______

Approved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 2-OCT-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	13 : 13	:	:	69								
L. Merced N. Surf.	1	80 : 80	:	:	65		8.6	270	87	256	31.0	753	
L. Merced S. Surf.	1	5000 : 5000	:	:	64		8.3	186	66	184	14.0	550	
Lower C.S. Outlet	1	2 : 2	:	:	62		8.1	56	11	62	0.9	173	
Lower C.S. Surf.	1	84 : 84	:	:	67		8.3	58	11	64	0.7	174	
Pilarcitos Surf.	1	2 : 2	:	:	65		7.9	55	16	54	0.6	175	
San Andreas Out.	1	17 : 17	:	:	62		7.8	62	12	68	0.3	182	
San Antonio Out.	1	8 : 8	:	:	69		8.3	108	21	122	0.9	328	
San Antonio Surf.	1	30 : 30	:	:	68		8.4	112	21	122	0.9	325	
Stone Dam Surf.	1	500 : 500	:	:	65		7.9	65	19	67	0.4	208	
Sunol Filt	1	120 : 120	:	:	68		7.7	168	29	212	0.1	542	
SVWTP Raw	1	8 : 8	:	:	68		8.2	104	15	112	0.7	293	
Tesla Portal	1	4 : 4	:	:	58		9.6	14	3	12	0.4	28	

Report generated by: Date:10/ 7/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Date: 10/7/98
Secondary review by:____ Date:______

Approved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 6-NOV-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	2 : 2	:	:	62								
L. Merced N. Surf.	1	1700 : 1700	:	:	60		8.4	276	89	258	28.0	798	
L. Merced S. Surf.	1	1100 : 1100	:	:	60		8.1	194	66	186	15.0	578	
Lower C.S. Outlet	1	23 : 23	:	:	65		8.1	58	10	62	1.1	169	
Lower C.S. Surf.	1	230 : 230	:	:	63		8.1	60	11	60	1.1	168	
Pilarcitos Surf.	1	7 : 7	:	:	58		8.1	56	18	56	1.6	175	
San Andreas Out.	1	4 : 4	:	:	65		8.0	62	12	68	0.2	181	
San Antonio Out.	1	<2 : <2	:	:	64		8.2	112	21	122	2.5	325	
San Antonio Surf.	1	8 : 8	:	:	65		8.4	110	21	122	1.9	327	
Stone Dam Surf.	1	300 : 300	:	:	58		8.0	64	20	64	0.3	209	
Sunol Filt	1	60 : 60	:	:	65		7.7	178	35	222	0.1	574	
SVWTP Raw	1	21 : 21	:	:	62		8.2	108	14	114	1.5	295	
Tesla Portal	1	17 : 17	:	:	58		9.4	14	3	11	0.3	26	

port generated by: Date:11/ 9/98
eld data verified by:____ Date:______
emistry data verified by:____ Date:______
cteriological data verified by: Date: 11/10/98
condary review by:____ Date:______

pproved by:____ Date:______

SAN FRANCISCO WATER DEPARTMENT

WEEKLY REPORT OF LABORATORY EXAMINATIONS

RAW WATERS

WEEK ENDING 4-DEC-98

Location	No. Anl.	TCol.MPN min : max	Fcol.MPN min : max	HPC min : max	Temp F.	Cl2 mg/l	pH	Alk. mg/l	Cl- mg/l	Hard. mg/l	Turb. NTU	Cond. um/cm	DO mg/l
Calaveras Surf.	1	7 : 7	:	:	58								
L. Merced N. Surf.	1	800 : 800	:	:	58		8.2	276	88	248	25.7	759	
L. Merced S. Surf.	1	1300 : 1300	:	:	58		8.2	192	66	180	16.6	576	
Lower C.S. Outlet	1	13 : 13	:	:	56		7.8	55	10	60	1.5	166	
Lower C.S. Surf.	1	17 : 17	:	:	58		7.8	55	10	62	1.4	165	
Pilarcitos Surf.	1	13 : 13	:	:	54		7.8	58	17	56	4.2	171	
San Andreas Out.	1	11 : 11	:	:	60		8.0	58	11	63	1.6	175	
San Antonio Surf.	1	4 : 4	:	:	58		8.2	110	21	120	1.5	320	
Stone Dam Surf.	1	1100 : 1100	:	:	54		7.9	70	21	80	7.8	239	
Sunol Filt	1	4 : 4	:	:	68		7.8	186	39	238	0.1	606	
SVWTP Raw	1	4 : 4	:	:	58		8.3	102	6	108	0.5	254	
Tesla Portal	1	30 : 30	:	:	54		9.7	15	3	11	0.4	28	

Report generated by: Ahc Date:12/ 9/98
Field data verified by:____ Date:______
Chemistry data verified by:____ Date:______
Bacteriological data verified by: Ahc Date: 12/9/98
Secondary review by:____ Date:______

Approved by:____ Date:______

San Francisco Water Department

Environmental and Field Services Section

Quarterly Limnological Profile and Plankton Count

1998

San Francisco Water Department
Reservoir: Lake Merced North
Date: 3/16/98

Water Quality Division
Guage Height:
Limnologist: JB, SPD

Limnological Profile

Depth Ft.	Temp. deg C	pH pH unts	Cond. umhos	TDS mg/L	D.O. mg/L	ORP mil.V	Turb. ntu's	Alk mg/L	Hard mg/L	Chlor mg/L	NO3asN mg/L	NH3-N mg/L	OrthP mg/L	Total P mg/L	TOC mg/L	Fl mg/L	Br mg/L	SO4 mg/L	MTBE ug/L
Surf.	15.5	8.50	864	518	9.6	274	10	233	231	82	<0.09	0.03	<0.02	0.09	7.7	0.11	0.42	16	<0.5
5	15.5	8.49	883	530	9.5	262	11	236	227	82	<0.09	0.02	<0.02	0.08	8.2	0.11	0.42	16	
10	14.2	8.05	974	584	4.9	231	11	231	229	82	<0.09	0.02	<0.02	0.10	8.4	0.11	0.42	16	<0.5
15	12.9	7.73	1020	612	0.37	206	13	240	232	82	<0.09	0.04	0.03	0.12	8.0	0.11	0.42	16	
16	12.9	7.73	1070	642	0.27	205													
25																			

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria	110	113	132	120	475	410,000,000
Mougeotia	70	160	120	120	470	4,100,000
Nauplius	2	2	2	4	10	86,000
Copepod	1	1	0	2	4	35,000

Secchi Disc : 2.0'
Air Temp : 13.2 C
Weather : Sunny
Wind : Calm

ENVIRONMENTAL SERVICES
SECTION
Reviewed: D. Dingman

Summary

Ammonia nitrogen is now detectable. Total phosphorous concentrations have also increased. Dissolved oxygen concentrations are already depleted at the bottom. TOC and turbidity levels are lower compared to previous profile. MTBE is non-detectable. Bluegreen algae population is down significantly from previous profile. - D.D.

Reservoir: Lake Merced East
Date: 3/16/98

Guage Height:
Limnologist: JB, SPD

Limnological Profile

Depth Ft.	Temp. deg C	pH pH unts	Cond. umhos	TDS mg/L	D.O. mg/L	ORP mil.V	Turb. ntu's	Alk mg/L	Hard mg/L	Chlor mg/L	NO3asN mg/L	NH3-N mg/L	OrthP mg/L	Total P mg/L	TOC mg/L	Fl mg/L	Br mg/L	SO4 mg/L	MTBE ug/L
Surf.	15.1	8.00	736	442	8.0	262	6.7	214	218	66	<0.09	0.03	<0.02	0.07	6.6	<0.1	0.35	26	<0.5
5	14.9	7.91	741	445	7.3	253	8.3	202	214	66	<0.09	0.02	<0.02	0.08	6.7	<0.1	0.35	26	
10	13.9	7.61	742	445	3.2	244	10	205	212	66	<0.09	0.04	<0.02	0.08	6.8	<0.1	0.35	26	<0.5
12	13.5	7.52	747	448	0.86	237													
16																			
25																			

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Osciilatoria	58	58	53	61	230	240,000,000
Rotifer	4	2	2	2	10	130,000
Anabaena	1	1	3	1	6	78,000
Copepod	1	1	1	2	5	65,000

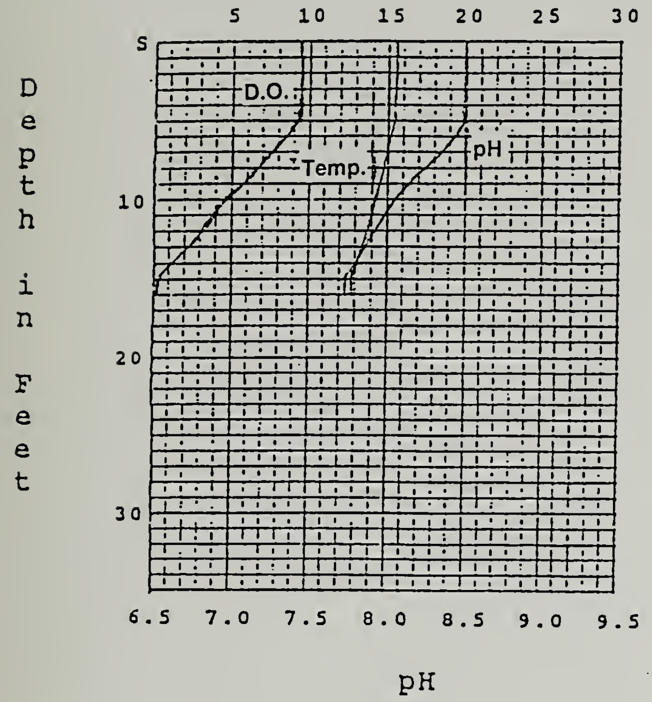
Secchi Disc : 2.0'
Air Temp : 13.2 C
Weather : Sunny
Wind : Calm

Summary

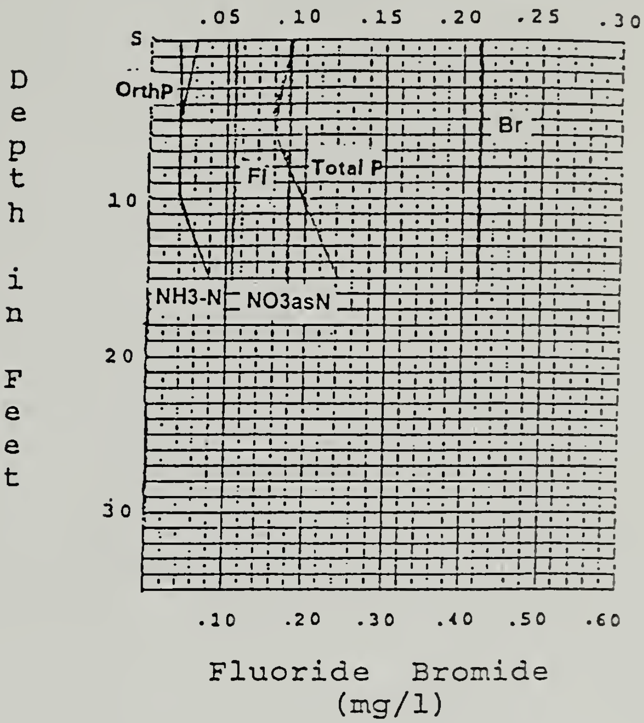
Nearly anoxic conditions exist at the bottom. Nutrient concentrations are slightly higher. Plankton population has decreased since previous profile. MTBE is not detectable. - D.D.

NORTH LAKE MERCED

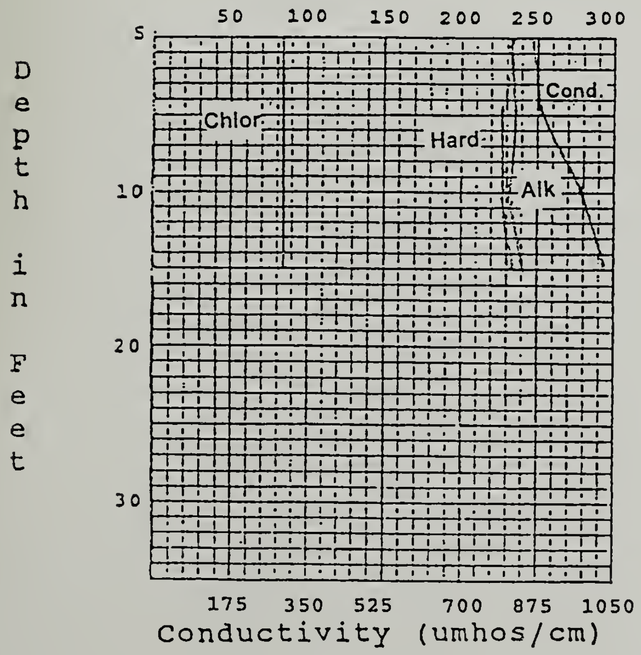
Temperature & Dissolved O2
($^\circ$C) (mg/l)



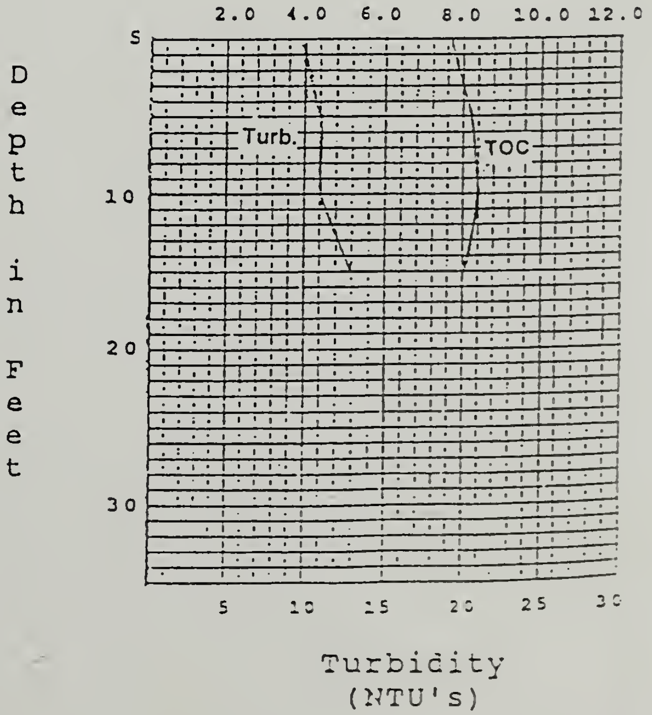
Nitrate-N Orthrophosphate
Total P Ammonia-N
(mg/l)



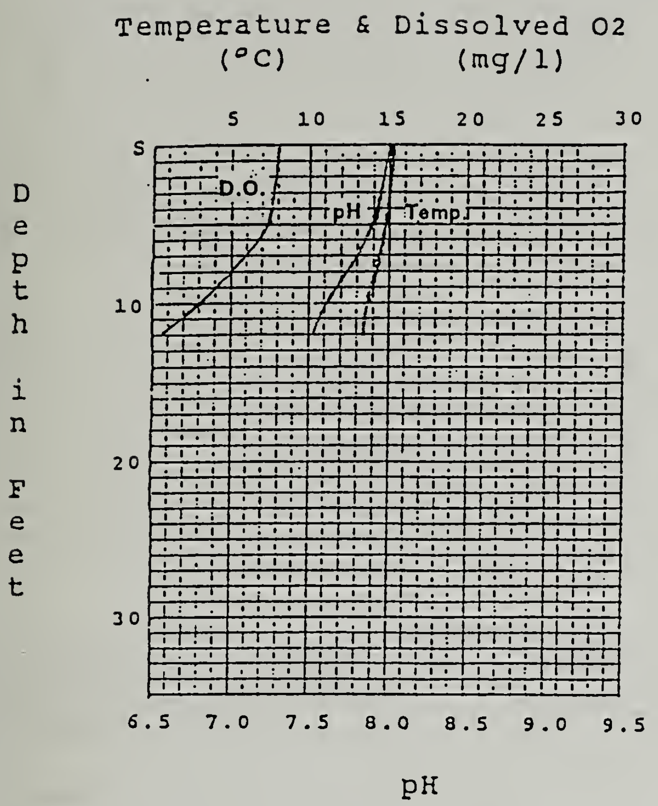
Alkalinity Hardness Chloride
(mg/l)

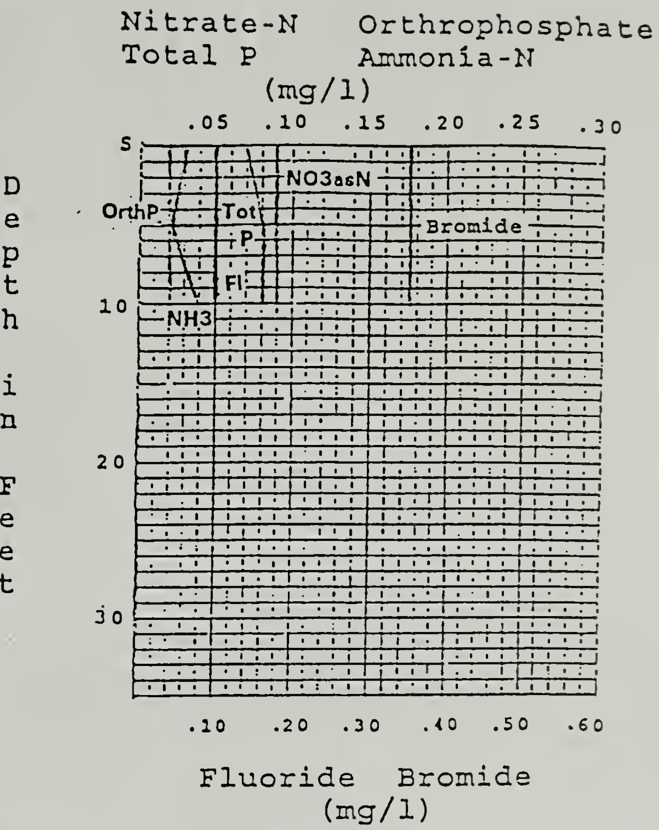


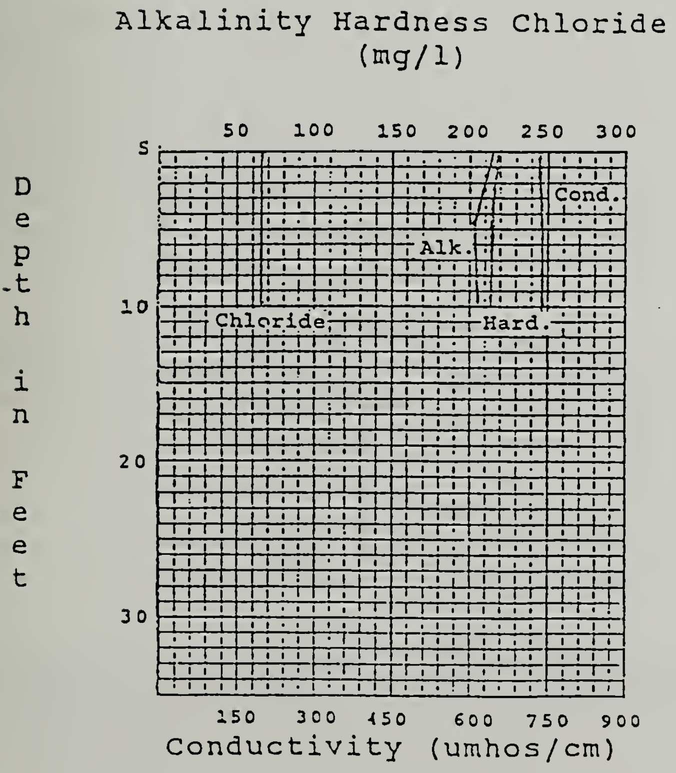
TOC
(mg/l)

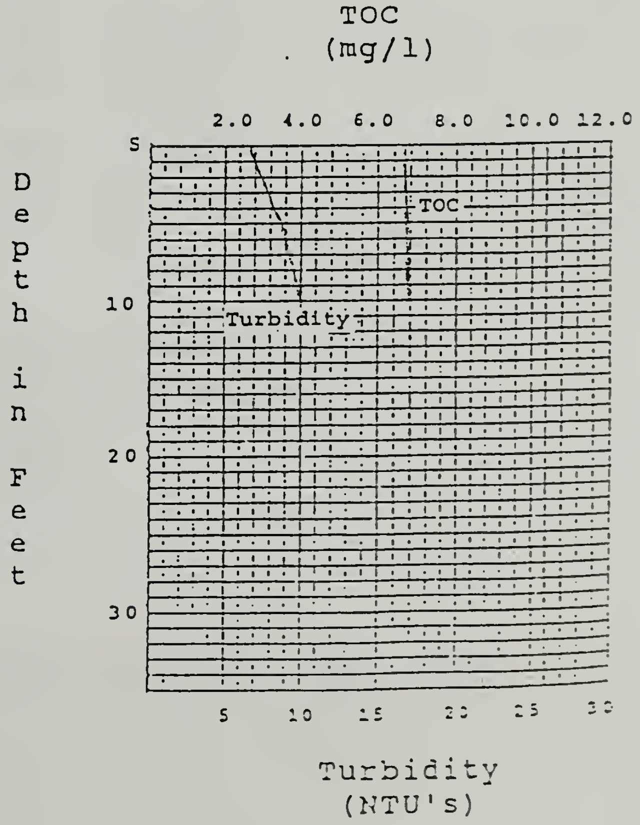


EAST LAKE MERCED









San Francisco Water Department **Water Quality Division**

Reservoir: Lake Merced South Across From Police Range
Date: 3/16/98

Guage Height:
Limnologist: SPD, JB

Limnological Profile

Depth Ft.	Temp. deg C	pH pH unts	Cond. umhos	TDS mg/L	D.O. mg/L	ORP mil.V	Turb. ntu's	Alk mg/L	Hard mg/L	Chlor mg/L	NO3asN mg/L	NH3-N mg/L	OrthP mg/L	Total P mg/L	TOC mg/L	Fl mg/L	Br mg/L	SO4 mg/L	MTBE ug/L
Surf.	15.1	8.16	590	354	8.6	292	8.4	162	157	58	<0.09	0.04	<0.02	0.05	5.9	0.36	0.26	16	1.9
6	14.1	8.02	603	362	7.9	291	9.9	155	156	58	<0.09	0.03	<0.02	0.06	7.1	0.36	0.26	16	
10																			2.0
12	14.0	7.97	613	368	7.5	289	11	158	163	58	<0.09	0.03	<0.02	0.07	5.6	0.36	0.26	16	
18	13.3	7.74	621	373	5.5	287	11	161	158	58	<0.09	0.03	<0.02	0.08	6.6	0.36	0.26	16	
19	13.3	7.75	629	377	5.4	287													

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria	115	93	95	110	413	540,000,000
Rotifer	4	2	2	2	10	130,000
Anabaena	1	1	3	1	6	78,000
Copepod	1	1	1	2	5	65,000

Secchi Disc : 2.0'
Air Temp : 14.5 C
Weather : Sunny
Wind : Calm

ENVIRONMENTAL SERVICES
SECTION
Reviewed: D. Dingman

Summary

Temperature and dissolved oxygen curves indicate seasonal stratification is beginning. Ammonia and total phosphorous concentrations are increasing. Bluegreen algae is half of what was found previously, but numbers are still high. MTBE concentration has increased possibly as a result of runoff. - D.D.

Reservoir: Lake Merced South Across From Pump Station
Date: 3/16/98

Guage Height:
Limnologist: SPD, JB

Limnological Profile

Depth Ft.	Temp. deg C	pH pH unts	Cond. umhos	TDS mg/L	D.O. mg/L	ORP mil.V	Turb. ntu's	Alk mg/L	Hard mg/L	Chlor mg/L	NO3asN mg/L	NH3-N mg/L	OrthP mg/L	Total P mg/L	TOC mg/L	Fl mg/L	Br mg/L	SO4 mg/L	MTBE ug/L
Surf.	15.6	8.29	555	333	9.2	297	9.8	155	156	58	<0.09	0.03	<0.02	0.05	5.4	0.36	0.26	16	1.9
5	15.1	8.26	554	332	9.2	299	10	160	161	58	<0.09	0.03	<0.02	0.05	6.5	0.36	0.26	16	
10																			1.9
12	14.9	8.16	560	336	8.7	285	8.6	158	154	58	<0.09	0.07	<0.02	0.05	5.5	0.36	0.26	16	
18	13.8	7.68	563	338	4.4	286	12	157	157	58	<0.09	0.07	<0.02	0.06	6.2	0.36	0.26	16	

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria	26	30	34	32	122	87,000,000
Anabaena	1	1	1	1	4	28,000
Mougeotia	0	2	2	0	4	28,000
Rotifer	0	0	1	1	2	14,000

Secchi Disc : 2.0'
Air Temp : 14.5 C
Weather : Sunny
Wind : Calm

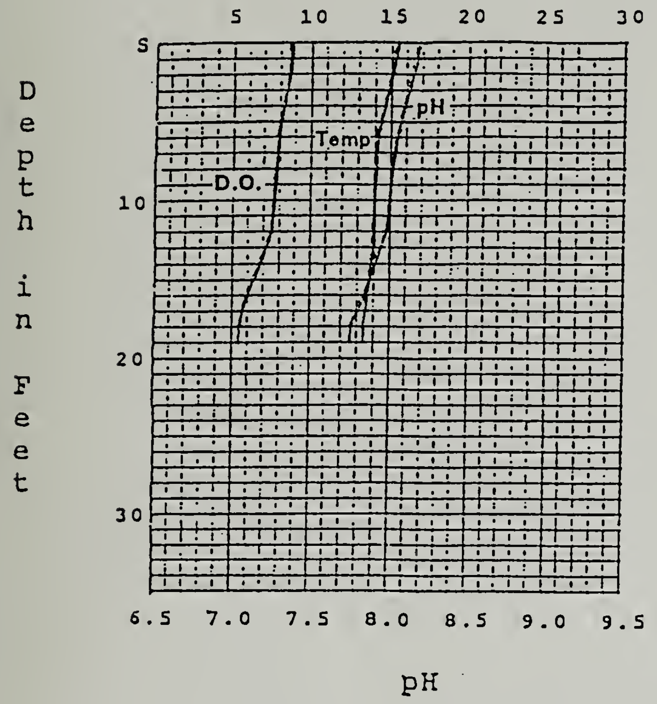
Summary

Nutrient concentrations have increased since previous profile. Temperature and dissolved oxygen curves indicate the start of seasonal stratification. TOC concentrations and plankton population are greatly reduced. MTBE concentrations have increased since previous profile. - D.D.

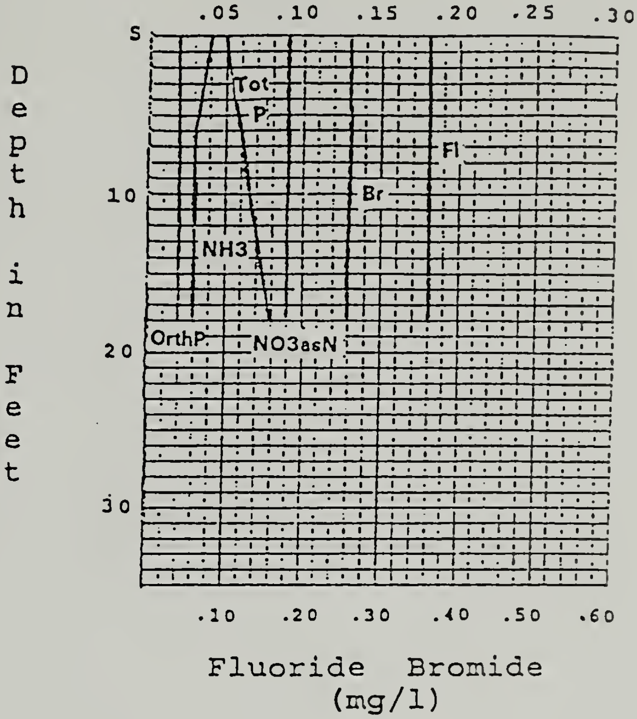
SOUTH LAKE MERCED

Lake Merced South Across From Police Range

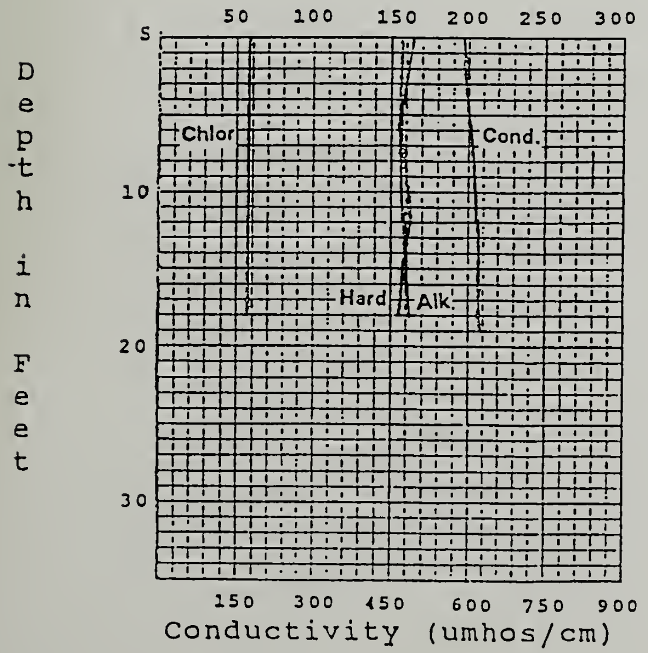
Temperature & Dissolved O2
(°C) (mg/l)



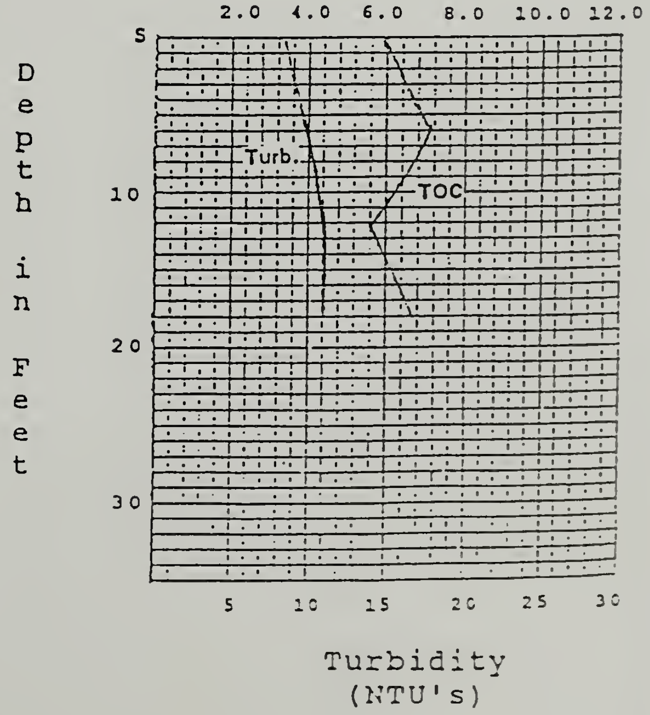
Nitrate-N Orthrophosphate
Total P Ammonia-N
(mg/l)



Alkalinity Hardness Chloride
(mg/l)

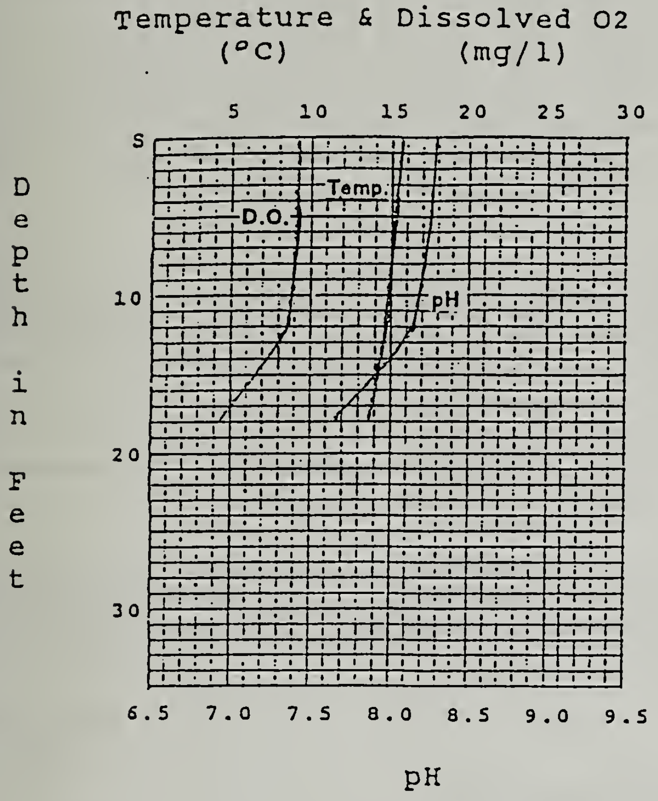


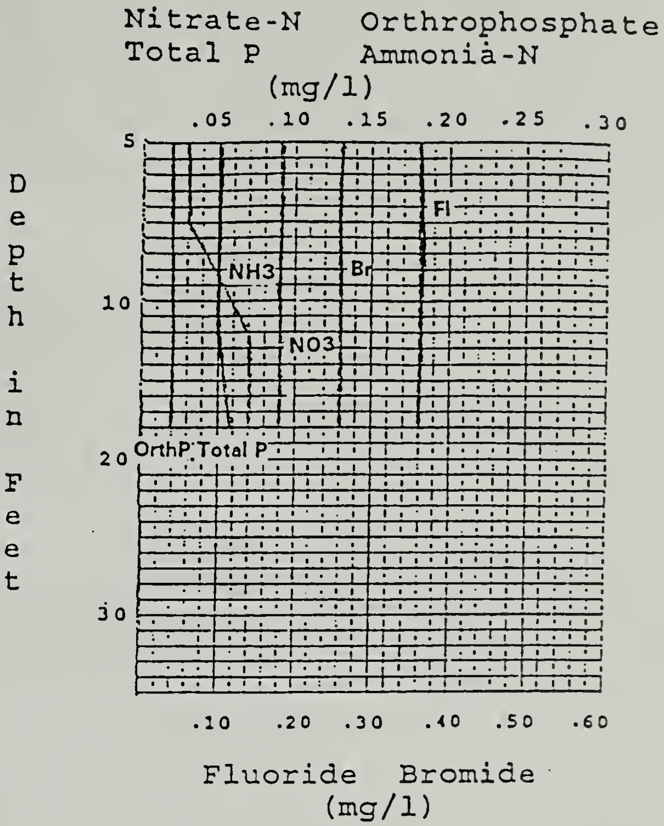
TOC
(mg/l)

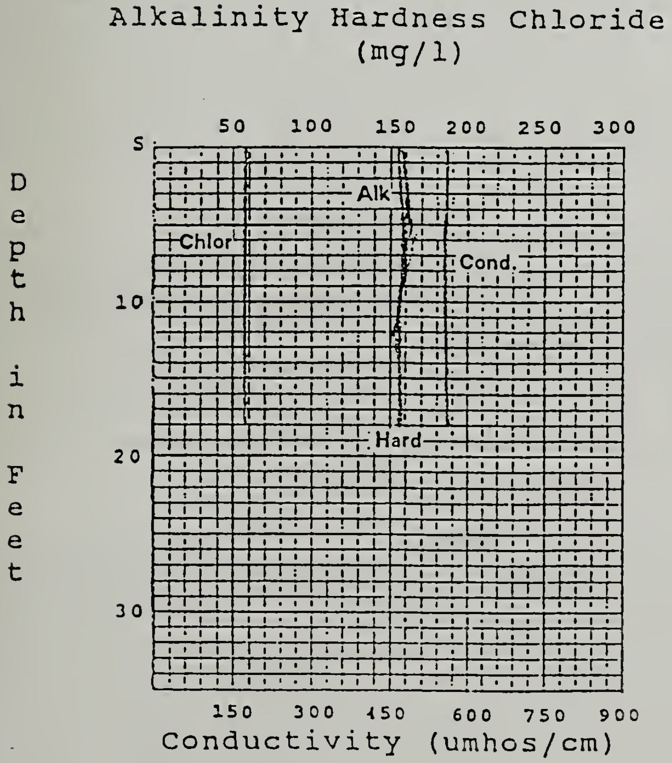


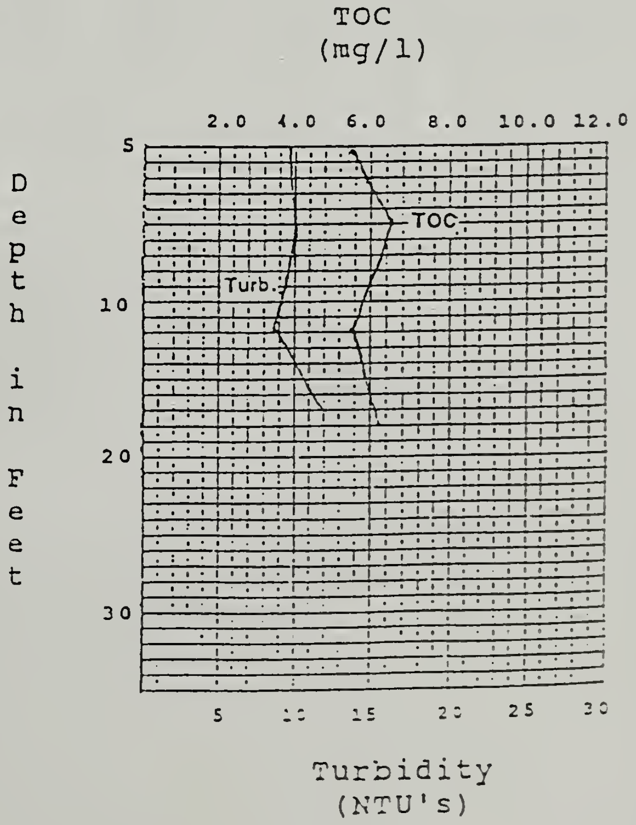
SOUTH LAKE MERCED

Lake Merced South Across From Pump Station









an Francisco Water Department
eservoir: Lake Merced North
ate: 8 July 1998

Water Quality Division
Guage Height:
Limnologist: JB, SPD

Limnological Profile

epth Ft.	Temp. deg C	pH pH unts	Cond. umhos	TDS mg/L	D.O. mg/L	ORP mil.V	Turb. ntu's	Alk mg/L	Hard mg/L	Chlor mg/L	NO3asN mg/L	NH3-N mg/L	OrthP mg/L	Total P mg/L	Fl mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE ug/L
urf.	18.3	8.79	728	466	9.3	290	32.6	244	240	83	<0.09	0.02	0.12	0.21	<0.1	9.7	0.06	0.14	<0.5
5	18.3	8.77	728	466	9.1	286	31.1	234	244	81	<0.09	0.05	0.13	0.22	<0.1	9.7	0.04	0.13	
10	18.2	8.73	728	466	8.5	280	25.6	236	244	81	<0.09	0.03	0.12	0.22	<0.1	9.4			<0.5
15	18.0	8.22	737	472	3.4	271	28.5	242	244	81	<0.09	0.02	0.17	0.28	<0.1	9.7	0.07	0.19	

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:100 dilution)	311	300	265	263	1139	1,500,000,000
Anabaena	200	199	184	226	809	10,000,000
Copepod	4	1	1	1	7	89,000
Rotifer	0	0	0	1	1	13,000
Nauplius	0	1	0	0	1	13,000

Secchi Disc : 1.0'
Air Temp : 16.4 C
Weather : Fog
Wind : W @ 5 MPH

ENVIRONMENTAL SERVICES SECTION
Reviewed: D. Dingman

Summary

Turbidity levels have increased since previous profile. Bluegreen algae population is extremely high. It may be a result of significant phosphorous concentrations. Detectable iron and manganese is found throughout the water column. - D.D.

Reservoir: Lake Merced East
Date: 8 July 1998

Guage Height:
Limnologist: JB, SPD

Limnological Profile

Depth Ft.	Temp. deg C	pH pH unts	Cond. umhos	TDS mg/L	D.O. mg/L	ORP mil.V	Turb. ntu's	Alk mg/L	Hard mg/L	Chlor mg/L	NO3asN mg/L	NH3-N mg/L	OrthP mg/L	Total P mg/L	Fl mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE ug/L
Surf.	17.5	8.16	706	452	6.9	315	19.4	224	235	73	<0.09	0.03	0.19	0.19	<0.1	8.4	0.03	0.15	<0.5
5	17.4	8.12	706	452	6.5	315	20.3	232	245	73	<0.09	0.02	0.17	0.19	<0.1	8.2	0.06	0.17	
10	17.3	8.03	706	452	5.6	315	18.3	234	255	73	<0.09	0.03	0.18	0.23	<0.1	8.3	0.04	0.17	<0.5

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:100 dilution)	217	217	211	232	877	1,700,000,000
Anabaena	14	19	14	16	63	1,300,000
Copepod	1	4	1	1	7	140,000
Nauplius	1	1	0	1	3	60,000

Secchi Disc : 1.5'
Air Temp : 16.4 C
Weather : Fog
Wind : W @ 5 MPH

ENVIRONMENTAL SERVICES SECTION
Reviewed: D. Dingman

Summary

Large bluegreen algae population dominates this lake. Phosphorous concentrations have significantly increased since previous profile. TOC concentrations have increased while MTBE continues to be non - detectable - D.D.

an Francisco Water Department
eservoir: Lake Merced South Across From Police Range
ate: 8 July 1998

Water Quality Division
Guage Height:
Limnologist: SPD, JB

Limnological Profile

epth Ft.	Temp. deg C	pH pH unts	Cond. umhos	TDS mg/L	D.O. mg/L	ORP mil.V	Turb. ntu's	Alk mg/L	Hard mg/L	Chlor mg/L	NO3asN mg/L	NH3-N mg/L	OrthP mg/L	Total P mg/L	Fl mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE ug/L
urf.	17.9	8.44	547	350	8.7	286	13.2	170	185	59	<0.09	0.06	<0.02	0.08	0.3	6.7	0.04	0.08	<0.5
5	17.9	8.42	547	350	8.5	282	12.3	170	185	58	<0.09	0.03	<0.02	0.10	0.3	6.8	0.05	0.08	
10	17.9	8.41	547	350	8.4	275	10.5	170	195	58	<0.09	0.03	<0.02	0.10	0.3	6.4			<0.5
15	17.6	7.78	550	352	4.6	273	9.7	170	195	58	<0.09	0.03	<0.02	0.07	0.3	6.5	0.05	0.09	
18	17.6	7.73	552	353	4.5	265													

Plankton Count

Organism	1	2	3	4	Total	No./cuM
scillatoria (1:50 dilution)	96	96	95	94	381	240,000,000
lothrix	263	253	263	220	999	13,000,000
nabaena	15	21	31	25	92	1,200,000
elosira	24	22	16	21	83	1,100,000
auplius	3	0	4	6	13	170,000
Copepod	1	2	3	6	12	150,000

Secchi Disc : 2.5'
Air Temp : 15.4 C
Weather : Fog
Wind : W @ 5 MPH

ENVIRONMENTAL SERVICES
SECTION
Reviewed:

Summary

The bluegreen algae, Oscillatoria, continues to dominate the plankton population. Slight increases in ammonia and phosphorous are found. Significant concentrations of dissolved oxygen remain at the bottom. No MTBE detected. - D.D.

Reservoir: Lake Merced South Across From Pump Station
Date: 8 July 1998

Guage Height:
Limnologist: SPD, JB

Limnological Profile

Depth Ft.	Temp. deg C	pH pH unts	Cond. umhos	TDS mg/L	D.O. mg/L	ORP mil.V	Turb. ntu's	Alk mg/L	Hard mg/L	Chlor mg/L	NO3asN mg/L	NH3-N mg/L	OrthP mg/L	Total P mg/L	Fl mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE ug/L
Surf.	18.5	8.70	544	348	10.1	289	10.8	166	185	60	<0.09	0.03	<0.02	0.07	0.3	6.7	0.06	0.06	<0.5
5	18.5	8.63	545	349	9.7	286	12.5	166	185	59	<0.09	0.04	<0.02	0.13	0.3	6.8	0.07	0.07	
10	18.4	8.57	546	349	9.1	278	10.2	170	185	58	<0.09	0.04	<0.02	0.09	0.3	6.4			<0.5
15	17.7	7.85	548	351	4.9	273	9.1	170	190	58	<0.09	0.03	<0.02	0.06	0.3	6.5	0.05	0.07	
18	17.6	7.68	552	353	3.2	269													

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:50 dilution)	171	165	141	159	636	360,000,000
Ulothrix	170	182	183	167	702	7,900,000
Anabaena	43	92	65	40	177	2,000,000
Melosira	24	15	16	24	79	890,000
Copepod	0	2	5	1	8	90,000
Nauplius	3	2	1	2	8	90,000

Secchi Disc : 2.5'
Air Temp : 15.4 C
Weather : Fog
Wind : W @ 5 MPH

ENVIRONMENTAL SERVICES
SECTION
Reviewed:

Summary

Bluegreen algae population has increased since the previous profile. Total phosphorous and TOC concentrations have increased also. Lake stratification continues to develop as shown by the oxygen curve. Turbidity levels remain unchanged while MTBE is non-detectable. - D.D.

San Francisco Water Department **Water Quality Bureau**

Reservoir: Lake Merced South Across From Police Range
Date: 23 September 1998

Gauge Height: No Reading
Limnologist: BPS, SPD

Limnological Profile

Depth ft	Temp °C	pH pH units	Cond µmhos	TDS mg/L	DO mg/L	ORP mil.V	Turb ntu	Alk mg/L	Hard mg/L	Cl$^-$ mg/L	NO_3-N mg/L	NH_3-N mg/L	Orth P mg/L	Total P mg/L	Fl$^-$ mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE µg/L
Surf.	19.5	8.41	585	375	7.9	287	18	175	180	65	<0.05	0.03	<0.02	0.11	0.3	7.1	0.06	0.16	<1.0
5	18.6	8.22	585	374	6.6	287	18	174	183	65	<0.05	0.03	<0.02	0.11	0.3	7.3			
10	18.6	8.16	585	374	6.1	283	19	173	183	65	<0.05	0.02	<0.02	0.12	0.3	7.0	0.07	0.16	<1.0
15	18.6	8.00	584	374	4.9	274	16	176	182	65	<0.05	0.01	<0.02	0.10	0.3	7.6			

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:50 dilution)	235	210	207	252	904	500,000,000
Anabaena	113	141	130	107	491	5,400,000
Anacystis	3	2	3	3	11	120,000
Spirulina	2	2	1	0	5	55,000
Nauplius Larva	3	1	1	0	5	55,000
Copepod	2	0	0	0	2	22,000
Rotifer	0	0	1	0	1	11,000
Ceratium	0	0	0	1	1	11,000
					Total	505,674,000

Depth ft	Chlorophyll-a µg/L	Algal Biomass µg/L
Surf.	75.2	5,040
10	53.2	3,560

Secchi Disc: 1.5'
Air Temp: 18.5 °C
Weather: Sunny
Wind: W @ 5 MPH

ENVIRONMENTAL SERVICES
SECTION
Reviewed: D. Dingman

Summary

Turbidity levels have increased since previous profile. Increases also occurred in manganese, iron and total phosphorous.
No MTBE was detected, however, the detection limit was raised due to instrument problems. -DD

Reservoir: Lake Merced South Across From Pump Station
Date: 23 September 1998

Gauge Height: No Reading
Limnologist: BPS, SPD

Limnological Profile

Depth ft	Temp °C	pH pH units	Cond µmhos	TDS mg/L	DO mg/L	ORP mil.V	Turb ntu	Alk mg/L	Hard mg/L	Cl$^-$ mg/L	NO_3-N mg/L	NH_3-N mg/L	Orth P mg/L	Total P mg/L	Fl$^-$ mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE µg/L
Surf.	19.6	8.46	585	374	8.0	287	22	176	181	65	<0.05	0.03	<0.02	0.11	0.3	6.9	0.06	0.16	<1.0
5	18.7	8.38	584	374	7.4	284	20	174	183	65	<0.05	0.01	<0.02	0.13	0.3	7.0			
10	18.7	8.33	585	374	7.0	265	19	174	181	65	<0.05	0.03	<0.02	0.12	0.3	7.6	0.05	0.17	<1.0
15	18.7	8.32	585	374	6.9	252	18	174	180	65	<0.05	0.03	<0.02	0.11	0.3	7.3			

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:50 dilution)	290	307	278	304	1179	690,000,000
Anabaena	168	137	163	173	641	7,500,000
Anacystis	4	6	9	10	29	340,000
Spirulina	4	1	5	6	16	190,000
Nauplius Larva	4	3	3	5	15	170,000
Ceratium	3	3	2	1	9	100,000
Copepod	0	2	3	4	9	100,000
Rotifer	0	0	0	1	1	12,000
					Total	698,412,000

Depth ft	Chlorophyll-a µg/L	Algal Biomass µg/L
Surf.	71.6	4,780
10	64.0	4,290

Secchi Disc: 1.5'
Air Temp : 17.7 °C
Weather: Sunny, Clear
Wind: Calm

ENVIRONMENTAL SERVICES
SECTION
Reviewed: D. Dingman

Summary

Dissolved oxygen concentration has increased at the bottom. Transparency has been reduced as a result of an increase in bluegreen algae population. Turbidity is also higher. Manganese concentrations have increased throughout the water column. Although no MTBE was detected, the detection limit was raised due to instrument problems. -DD

San Francisco Water Department **Water Quality Bureau**

Reservoir: Lake Merced North
Date: 23 September 1998

Gauge Height: No Reading
Limnologist: BPS, SPD

Limnological Profile

Depth ft	Temp °C	pH pH units	Cond μmhos	TDS mg/L	DO mg/L	ORP mil.V	Turb ntu	Alk mg/L	Hard mg/L	Cl^- mg/L	NO_3-N mg/L	NH_3-N mg/L	Orth P mg/L	Total P mg/L	F^- mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE μg/L
Surf.	19.6	8.75	774	495	8.6	264	9.0	255	251	86	<0.05	0.06	0.11	0.31	0.1	9.0	0.07	0.23	<1.0
5	18.9	8.59	757	484	6.4	251	9.6	248	256	87	<0.05	0.05	0.11	0.31	0.1	9.6			
10	18.8	8.40	761	487	4.2	232	9.6	258	249	87	<0.05	0.04	0.12	0.32	0.1	9.6	0.07	0.24	<1.0
15	18.8	8.21	764	489	1.1	202	9.2	252	253	87	<0.05	0.06	0.13	0.33	0.1	9.2			

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:50 dilution)	250	258	245	262	1,015	1,800,000,000
Anabaena	3	2	7	5	17	310,000
Closteriopsis	0	0	4	3	7	130,000
Mougeotia	2	0	0	0	2	36,000
Nauplius Larva	0	0	1	0	1	18,000
					Total	1,800,494,000

Depth ft	Chlorophyll-a μg/L	Algal Biomass μg/L
Surf.	83.2	5,570
10	73.6	4,930

Secchi Disc: 1.0'
Air Temp: 18.5 °C
Weather: Sunny
Wind: W @ 5 MPH

ENVIRONMENTAL SERVICES SECTION

Reviewed: D. Dingman

Summary

Dissolved oxygen is nearly depleted. Turbidity levels are much improved since previous profile, Bluegreen algae populations have increased along with total phosphorous and manganese concentrations. Although MTBE was not detected, the limit of detection was increased due to instrument problems. -DD

Reservoir: Lake Merced East
Date: 23 September 1998

Gauge Height: No Reading
Limnologist: BPS, SPD

Limnological Profile

Depth ft	Temp °C	pH pH units	Cond μmhos	TDS mg/L	DO mg/L	ORP mil.V	Turb ntu	Alk mg/L	Hard mg/L	Cl^- mg/L	NO_3-N mg/L	NH_3-N mg/L	Orth P mg/L	Total P mg/L	F^- mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE μg/L
Surf.	19.3	8.31	762	488	7.6	299	25	245	254	81	<0.05	0.02	0.15	0.28	<0.1	8.8	0.10	0.24	<1.0
5	18.7	8.16	763	488	6.1	297	23	258	252	81	<0.05	0.02	0.15	0.29	<0.1	8.5			
10	18.6	8.13	763	488	5.7	297	20	255	256	81	<0.05	0.02	0.15	0.29	<0.1	8.4	0.12	0.21	<1.0

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:50 dilution)	223	232	223	184	862	790,000,000
Anabaena	6	7	4	12	29	530,000
Mougeotia	2	0	5	4	11	200,000
Cymbella	0	1	3	0	4	73,000
Copepoda	0	0	1	1	2	37,000
Rotifer	0	0	2	0	2	37,000
Synedra	2	0	0	0	2	37,000
Anacystis	0	0	1	0	1	18,000
Closteriopsis	0	0	0	1	1	18,000
Zygnema	0	0	1	0	1	18,000
					Total	790,968,000

Depth ft	Chlorophyll-a μg/L	Algal Biomass μg/L
Surf.	57.6	3,860
10	39.6	2,650

Secchi Disc: 1.5'
Air Temp : 18.9 °C
Weather: Sunny
Wind: W @ 5 MPH

ENVIRONMENTAL SERVICES SECTION

Reviewed: D. Dingman

Summary

Iron, manganese, and total phosphorous concentrations have increased. Turbidity levels have increased at all depths. Bluegreen algae population has declined since previous profile. MTBE was not detected, however, detection limit was raised due to instrument problems. -DD

San Francisco Water Department
Reservoir: Lake Merced South Across From Police Range
Date: 22 December 1998

Water Quality Bureau
Gauge Height: No Reading
Limnologist: BPS, JB

Limnological Profile

Depth ft	Temp °C	pH pH units	Cond µmhos	TDS mg/L	DO mg/L	ORP mil.V	Turb ntu	Alk mg/L	Hard mg/L	Cl^- mg/L	NO_3-N mg/L	NH_3-N mg/L	Orth P mg/L	Total P mg/L	F^- mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE µg/L
Surf.	9.24	8.39	574	368	10.6	358	22.0	180	182	68	<0.05	- -	<0.02	0.08	0.29	6.2	- -	- -	<1.0
5	9.15	8.38	574	368	10.5	356	21.2	180	182	68	<0.05	- -	<0.02	0.08	0.29	6.1	- -	- -	
10	9.11	8.35	574	368	10.4	352	25.5	185	184	68	<0.05	- -	<0.02	0.09	0.29	6.2	- -	- -	<1.0
15	9.09	8.33	575	368	10.3	346	22.5	175	180	68	<0.05	- -	<0.02	0.09	0.29	6.2	- -	- -	
17	9.08	8.30	575	368	10.4	336													

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:10)	353	347	338	335	13,730	120,000,000
Anacystis	6	7	2	8	23	200,000
Fragilaria	6	3	4	0	13	110,000
Anabaena	2	0	2	2	6	53,000
Actinastrum	2	0	1	2	5	44,000
Copepod	1	2	0	0	3	26,000
Arthrodesmus	0	1	1	0	2	18,000
Anomoeoneis	1	0	0	0	1	8,800
Kirchneriella	0	1	0	0	1	8,800
Staurastrum	0	0	1	0	1	8,800
Synedra	0	0	0	1	1	8,800
					Total	120,486,200

Depth ft	Chlorophyll-a µg/L	Algal Biomass µg/L
Surf.	27.8	1,863
10	26.7	1,789

Secchi Disc: 1.5'
Air Temp: 7.1 °C
Weather: Sunny, Clear
Wind: @ 0 - 5 MPH

ENVIRONMENTAL SERVICES SECTION
Reviewed: D. Dingman

Summary

Plankton population is only 20% of what it was in September. Total phosphorous concentrations have dropped slightly. MTBE remains nondetectable. Analysis of samples for iron, manganese and ammonia were not performed. - D.D.

Reservoir: Lake Merced South Across From Pump Station
Date: 22 December 1998

Gauge Height: No Reading
Limnologist: BPS, JB

Limnological Profile

Depth ft	Temp °C	pH pH units	Cond µmhos	TDS mg/L	DO mg/L	ORP mil.V	Turb ntu	Alk mg/L	Hard mg/L	Cl^- mg/L	NO_3-N mg/L	NH_3-N mg/L	Orth P mg/L	Total P mg/L	F^- mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE µg/L
Surf.	9.11	8.27	574	367	10.6	322	20.7	180	184	68	<0.05	- -	<0.02	0.08	0.29	6.3	- -	- -	<1.0
5	9.09	8.24	574	367	10.5	318	21.7	175	184	68	<0.05	- -	<0.02	0.09	0.29	6.3	- -	- -	
10	9.05	8.14	574	367	10.4	306	21.2	175	182	68	<0.05	- -	<0.02	0.09	0.29	6.1	- -	- -	<1.0
15	9.03	8.04	574	367	10.4	293	20.1	180	180	68	<0.05	- -	<0.02	0.11	0.29	6.3	- -	- -	
17	9.02	7.89	574	367	10.5	282													

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:10)	389	471	451	468	17,790	120,000,000
Anacystis	6	5	5	4	20	140,000
Fragilaria	5	3	4	5	17	120,000
Closterium	3	0	4	3	10	71,000
Anabaena	1	1	1	0	3	21,000
Arthrodesmus	2	0	1	0	3	21,000
Actinastrum	1	1	0	1	3	21,000
Copepod	0	1	0	2	3	21,000
Synedra	1	0	0	0	1	7,100
Spondylosium	1	0	0	0	1	7,100
Staurastrum	0	0	1	0	1	7,100
Cymbella	0	0	0	1	1	7,100
					Total	120,443,400

Depth ft	Chlorophyll-a µg/L	Algal Biomass µg/L
Surf.	17.7	1,186
10	18.9	1,264

Secchi Disc: 1.5'
Air Temp : 7.1 °C
Weather: Sunny, Clear
Wind: S @ 0 - 5 MPH

ENVIRONMENTAL SERVICES SECTION
Reviewed: D. Dingman

Summary

Plankton population has declined significantly since previous profile due to seasonal conditions. MTBE concentrations remain undetectable. Analysis for iron, manganese, and ammonia were not performed. - D.D.

San Francisco Water Department
Reservoir: Lake Merced North
Date: 22 December 1998

Water Quality Bureau
Gauge Height: No Reading
Limnologist: BPS, JB

Limnological Profile

Depth ft	Temp °C	pH pH units	Cond µmhos	TDS mg/L	DO mg/L	ORP mil.V	Turb ntu	Alk mg/L	Hard mg/L	Cl⁻ mg/L	NO_3-N mg/L	NH_3-N mg/L	Orth P mg/L	Total P mg/L	Fl⁻ mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE µg/L
Surf.	9.58	8.44	770	493	9.8	373	31.1	250	250	89	<0.05	- -	<0.02	0.12	<0.1	8.7	- -	- -	<1.0
5	9.14	8.40	759	486	9.1	370	29.3	250	250	89	<0.05	- -	0.03	0.17	<0.1	8.5	- -	- -	
10	9.11	8.37	759	486	9.0	366	33.6	250	246	89	<0.05	- -	<0.02	0.16	<0.1	8.6	- -	- -	<1.0
13	9.11	8.35	759	486	8.9	360	30.1	250	254	89	<0.05	- -	<0.02	0.16	<0.1	8.7	- -	- -	

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria (1:10)	297	279	261	282	11,190	150,000,000
Rotifer	1	0	0	1	2	27,000
Fragilaria	1	0	0	1	2	27,000
Spirulina	1	0	0	0	1	14,000
Nauplius	0	1	0	0	1	14,000
Dinobryon	0	0	1	0	1	14,000
Mougeotia	0	0	1	0	1	14,000
Closterium	0	0	0	1	1	14,000
					Total	150,124,000

Depth ft	Chlorophyll-a µg/L	Algal Biomass µg/L
Surf.	27.4	1,836
10	25.0	1,675

Secchi Disc: 1.0'
Air Temp: 9.8 °C
Weather: Sunny, Clear
Wind: S @ 5 MPH

ENVIRONMENTAL SERVICES
SECTION
Reviewed: D. Dingman

Summary

Plankton population has actually declined since previous monitoring. MTBE concentrations remain undetectable. Nutrient concentrations are also lower than previous profile. Iron, manganese and ammonia analysis were not performed. Turbidity levels have increased due to seasonal mixing. - D.D.

Reservoir: Lake Merced East
Date: 22 December 1998

Gauge Height: No Reading
Limnologist: BPS, JB

Limnological Profile

Depth ft	Temp °C	pH pH units	Cond µmhos	TDS mg/L	DO mg/L	ORP mil.V	Turb ntu	Alk mg/L	Hard mg/L	Cl⁻ mg/L	NO_3-N mg/L	NH_3-N mg/L	Orth P mg/L	Total P mg/L	Fl⁻ mg/L	TOC mg/L	Fe mg/L	Mn mg/L	MTBE µg/L
Surf.	8.55	8.38	733	469	11.5	335	32.2	250	252	83	<0.05	- -	0.03	0.17	<0.1	7.5	- -	- -	<1.0
5	8.07	8.34	733	469	11.2	326	34.4	245	248	83	<0.05	- -	0.03	0.16	<0.1	7.4	- -	- -	
10	7.99	8.33	734	469	11.2	303	32.5	245	250	82	<0.05	- -	0.04	0.18	0.1	7.5	- -	- -	<1.0

Plankton Count

Organism	1	2	3	4	Total	No./cuM
Oscillatoria	70	72	84	74	300	200,000,000
Fragilaria					16	31,000
Rotifer					6	12,000
Copepod					2	3,900
Staurastrum					2	3,900
Cladoceran					1	1,900
Nauplius Larva					1	1,900
Nematode					1	1,900
Navicula					1	1,900
					Total	200,058,400

Depth ft	Chlorophyll-a µg/L	Algal Biomass µg/L
Surf.	43.2	2,894
10	34.8	2,332

Secchi Disc: 1.0'
Air Temp : 8.0 °C
Weather: Sunny, Clear
Wind: S @ 5 MPH

ENVIRONMENTAL SERVICES
SECTION
Reviewed: D. Dingman

Summary

Nutrient concentrations have decreased since previous profile. Turbidity levels have increased. Plankton population has declined due to seasonal changes. MTBE continues to be nondetectable. No analysis of samples for iron, manganese and ammonia were performed. - D.D.

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San Francisco Groundwater Master Plan Technical Memorandum, TM-18, Westside Basin, Groundwater Model

Groundwater Quality Data

May 9, 1997

Analysis	Units	Sample Name	Zoo Well #3		Oceanside WPCP		Edgewood School		West Sunset Playground	
		Date	(11/2/93)		(11/5[illegible])		(11/19/93)		(12/21/93)	
		ID	S-3-1	Blank	S-OSWPCP-1	Blank	S-ECC-1	Blank	WPS-1	Blank
Total Coliform	MPN/100 mL		<2	NA	2	NA	2	NA	4	NA
Fecal Coliform	MPN/100 mL		<2	NA	<2	NA	<2	NA	<2	NA
(MPN = Most Probable Number)										
Aluminum	ug/L		80.1	<50	<50	<50	<50	<50	<100	<100
Arsenic	ug/L		3.2	<2	3	<2	<2	<2	<200	<200
Barium	ug/L		33.1	<5	22	<5	39.6	<5	<10	<10
Cadmium	ug/L		<10	<10	<10	<10	<10	<10	<10	<10
Calcium	ug/L		36500	<100	27000	<100	29400	<100	15800	<100
Chromium^	ug/L		17.7	<1	1.9	<1	29.2	<1	24.7	<1
Copper^	ug/L		2	<1	<1	<1	16	<1	1.5	<1
Iron	ug/L		99.2	<50	147	<50	130	<50	[illegible]	<50
Lead^	ug/L		1.9	<1	<1	<1	2.7	<1	<1	<1
Magnesium	ug/L		42500	<50	34700	<50	30700	<50	15700	<100
Manganese	ug/L		<5	<5	[illegible]	<5	<5	<5	19.4	<10
Mercury^^	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	ug/L		<1	<1	<1	<1	<1	<1	<200	<200
Silver	ug/L		<20	<20	<20	<20	<20	<20	<10	<10
Sodium	ug/L		37400	<100	43800	<100	30300	<100	23100	<100
Fluoride	mg/L		0.11	<0.1	<0.2	<0.2	0.14	<0.1	<0.1	<0.1
Total Alkalinity	mg/L		165	<10	146	<10	99	<10	68	<10
Bicarbonate Alkalinity	mg/L		165	<10	148	<10	99	<10	68	<10
Carbonate Alkalinity	mg/L		<10	<10	<10	<10	<10	<10	<10	<10
Nitrate	mg/L		10.8	<0.1	1.8	<0.1	9.7	<0.1	4.1	<0.1
Sulfate	mg/L		31	<1	6.6	<1	42	<1	23.5	<1
Chloride	mg/L		39	<0.2	67.5	<0.2	25	<0.2	21.2	<0.2
pH	pH unit		7.8	NA	7.6	NA	7.8	NA	7.91	NA
EC	umhos		590	NA	640	NA	450	NA	280	NA
Total Hardness	mg/L		238	<2	181	<2	185	<2	98	<2
TDS	mg/L		345	<10	265	<10	275	<10	165	<10
Color	Color Units		<10	<10	<10	<10	<10	<10	<10	<10
Odor	TON		<1	NA	<1	<1	<1	NA	<1	<1
Turbidity	NTU		<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodiflouromethane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl Chloride	ug/L		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	ug/L		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloroethane	ug/L		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloromethane	ug/L		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Triflourochloromethane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	ug/L		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
t-1,2-Dichloroethene	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,2-Dichloropropane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromochloromethane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5
1,1,1-Trichloroethane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	ug/L		<0.5	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloropropene	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
t-1,3-Dichloropropene	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ug/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	ug/L		<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5

NA = not analyzed

^ Analyzed by GFAA

^^ EPA Method 7471

* Total coliform MCL is based on the presence/absence of total coliforms in samples, rather than coli

For systems analyzing at least 40 samples per month, the total coliform MCL = no more than 5% of t

coliform samples may be coliform-positive. For systems analyzing less than 40 samples per month,

MCL = no more than 1 sample a month may be coliform-positive.

— Exceeds California Secondary MCL for Manganese (50 ug/L)

— Exceeds California Secondary MCL for Iron (300 ug/L)

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GROUNDWATER MASTER PLAN

SUMMARY OF WESTSIDE SAMPLING DATA

January

Table 7A

a portion of WQ data from GWMP
TM-8 "Westside Basin Field Investigation"

United States Geological Survey

Geohydrology, Water Quality, and Water Budgets of Golden Gate Park and the Lake Merced Area in the Western Park of San Francisco, California

Groundwater Quality Data

1990

APPENDIX A. Ground-Water Quality Data

[Data are given in milligrams per liter unless otherwise noted. °C, Degree Celsius; µS/cm, microsiemens per centimeter, <, less than; --, no data]

Map No.	Well name or sample source	Station No.	Date	Specific conductance (µS/cm)	pH (standard units)	Temperature, water (°C)	Calcium, dissolved	Magnesium, dissolved
1	Northwest Windmill	374616122303001	03-02-88	385	7.9	--	19	23
			05-04-88	371	8.0	18.5	19	22
2	Northeast Windmill	374616122303002	03-02-88	660	7.5	--	33	42
3	South Windmill	374555122302801	03-02-88	420	7.7	--	22	25
			05-04-88	467	7.8	17.5	25	29
4	Elk Glen	374605122284801	03-02-88	529	7.7	17.5	31	33
			05-04-88	586	7.9	17.0	34	37
5	Arboretum No. 5	374558122281001	03-02-88	588	7.2	16.5	32	41
			05-04-88	572	7.3	16.0	31	40
7	Alvord	374602122271001	03-02-88	625	7.8	17.5	30	32
			05-04-88	620	7.9	17.0	33	34
8	Stanyan Street	374547122270501	11-19-87	507	6.8	14.5	34	22
9	HLA B	374544122303001	11-18-87	805	7.5	18.5	52	48
			03-02-88	784	7.6	16.5	50	47
			05-03-88	792	7.6	18.0	51	49
10	HLA E	374516122302701	11-18-87	952	7.0	18.0	47	39
			03-01-88	886	7.3	18.0	47	38
			05-03-88	815	7.3	17.0	45	37
11	HLA G	374450122302401	11-19-87	622	7.7	17.0	27	31
			03-01-88	615	7.5	18.0	27	32
			05-04-88	603	7.9	--	27	32
12	HLA J	374424122301901	11-20-87	530	6.8	15.5	16	17
			03-01-88	702	6.9	18.0	22	26
			05-04-88	727	7.0	18.5	22	26
13	HLA K	374409122301701	11-20-87	787	7.4	16.5	34	30
			02-29-88	727	7.1	18.0	28	28
			05-02-88	707	7.2	18.0	27	27
15	HLA O	374409122300701	02-29-88	413	7.0	19.0	13	15
			05-03-88	601	7.0	--	15	24
16	HLA V	374346122300501	11-18-87	907	7.5	18.0	43	54
			05-02-88	891	7.2	19.0	40	47
			02-29-88	922	7.2	18.0	42	48
17	Lawton North	374519122300801	11-16-87	591	7.5	17.5	42	31
18	Moraga North	374523122300901	03-02-88	597	7.6	--	33	33
			05-03-88	581	7.6	19.0	34	35
19	Santiago South	374436122300501	11-19-87	550	7.2	18.0	29	25
			03-02-88	591	7.4	--	30	28
			05-03-88	618	7.2	18.5	34	31
20	Zoo No. 4	374406122301702	05-02-88	559	7.7	20.0	27	30
			03-01-88	625	7.7	19.0	29	33
21	Zoo No. 3	374406122301701	11-17-87	524	8.0	20.5	28	31
22	Stern Grove irrigation	374412122284901	11-17-87	591	7.2	18.0	30	32
			03-02-88	582	7.1	18.0	31	34
			05-04-88	522	7.1	18.0	28	31

Sodium, dissolved	Potassium, dissolved	Bicarbonate, (as HCO_3)	Carbonate, (as CO_3)	Alkalinity, (as $CaCO_3$)	Sulfate, dissolved	Chloride, dissolved	Fluoride, dissolved	Bromide, dissolved	Silica, dissolved	Nitrogen, NO_2+NO_3, dissolved (as N)
26	1.3	146	0	120	8.6	38	0.20	0.11	44	2.4
26	1.4	152	0	125	8.2	36	.10	.12	43	2.5
34	1.9	258	0	211	48	47	.20	.16	37	--
23	1.2	142	0	116	15	35	.10	.11	41	6.5
26	1.7	166	0	136	28	39	.10	.15	39	7.9
26	1.1	154	0	126	29	41	.20	.16	43	12
28	1.3	174	0	143	41	46	.10	.24	42	14
26	2.4	196	0	161	33	30	.10	.24	38	15
26	2.6	194	0	159	38	28	.10	.25	36	17
47	1.1	214	0	175	30	59	.20	.30	47	--
50	1.1	216	0	177	33	56	.20	.31	49	9.7
38	1.0	181	0	148	42	30	.20	.15	27	4.9
39	9.2	301	0	247	48	47	.10	.35	31	15
39	9.0	296	0	243	44	50	.10	.31	30	14
39	11	308	0	252	54	47	.10	.35	31	16
80	13	185	0	152	72	130	.20	.55	21	16
70	12	180	0	148	65	130	.20	.45	24	14
67	19	182	0	149	71	110	.10	.42	24	12
46	4.7	171	0	140	48	56	.10	.24	30	8.8
47	4.5	166	0	136	43	60	.10	.24	31	4.1
48	5.5	164	0	134	52	60	.10	.25	30	9.6
58	7.0	98	0	80	31	65	.20	.24	19	8.9
79	9.6	130	0	107	34	93	.20	.36	29	8.2
78	12	160	0	131	46	87	.20	.39	27	16
77	8.8	200	0	164	58	75	.30	.32	17	14
77	8.5	206	0	169	54	79	.30	.28	17	8.5
77	9.8	194	0	159	62	77	.30	.34	16	6.3
46	1.0	74	0	61	30	64	.10	.26	28	3.1
68	.80	115	0	94	56	81	.10	1.2	40	8.5
70	3.8	434	0	356	2.7	110	.20	.26	38	.10
83	5.0	432	0	354	13	92	.20	.29	37	.42
89	4.2	430	0	352	15	100	.20	.28	39	.10
30	6.6	--	0	152	37	50	.10	.42	22	8.5
29	4.8	182	0	149	49	43	.10	.21	27	--
31	5.4	186	0	152	55	42	.10	.22	28	11
40	3.7	161	0	132	22	55	.10	.34	22	6.4
41	4.2	186	0	152	26	60	.10	.35	21	--
46	5.5	208	0	170	33	60	.10	.38	22	8.7
39	2.1	174	0	143	34	49	.10	.22	38	2.1
42	1.8	176	0	144	29	54	.20	.21	40	9.5
33	1.9	177	0	145	26	42	.20	.20	37	9.1
41	.90	163	0	133	45	46	.10	.28	43	13
36	1.0	172	0	141	31	39	.10	.25	46	14
32	1.0	164	0	134	42	31	.10	.24	43	15

APPENDIX A. Ground-Water Quality Data—*Continued*

Map No.	Well name or sample source	Station No.	Date	Specific conductance (µS/cm)	pH (standard units)	Temperature, water (°C)	Calcium, dissolved	Magnesium, dissolved
24	Lake Merced	374330122295601	11-17-87	654	8.3	15.5	31	32
			03-01-88	643	8.2	14.0	31	33
			05-02-88	650	8.6	18.0	30	33
26	San Francisco State University .	374325122282801	11-19-87	695	8.0	18.0	70	15
			02-29-88	683	8.0	21.5	68	16
			05-03-88	668	8.1	17.5	--	--
27	Olympic Club	374226122290701	11-19-87	593	7.9	18.0	28	31
28			03-01-88	571	7.8	18.0	28	31
			05-02-88	568	7.8	20.0	26	30
29	San Francisco Golf Club	374235122283801	11-19-87	611	8.0	17.0	34	32
			03-01-88	606	7.8	16.5	34	32
			05-03-88	588	7.8	17.0	33	32
--	Seawater	374407122302601	11-17-87	48,900	8.0	14.5	330	1,000
--	Municipal water	374302122290801	11-17-87	53	8.9	15.0	6.5	.58
			03-01-88	39	7.8	11.0	4.9	.12
			05-02-88	38	8.8	12.0	5.0	.30
--	Rain	374346122300501	02-29-88	11	5.6	--	.46	.01
--	Runoff	374408122301301	11-17-87	167	7.7	15.5	3.8	1.5

Sodium, dissolved	Potassium, dissolved	Bicarbonate, (as HCO_3)	Carbonate, (as CO_3)	Alkalinity, (as $CaCO_3$)	Sulfate, dissolved	Chloride, dissolved	Fluoride, dissolved	Bromide, dissolved	Silica, dissolved	Nitrogen, NO_2+NO_3, dissolved (as N)
59	2.1	244	0	200	23	75	0.40	0.22	38	0.10
59	2.1	234	0	192	28	79	.30	.19	34	.10
60	2.4	230	8	202	35	78	.30	.21	35	.10
57	1.3	278	0	228	46	35	.30	.58	17	8.0
59	1.3	278	0	228	44	37	.30	.71	18	7.6
--	--	284	0	233	--	--	--	--	--	--
42	1.9	188	0	154	20	67	.10	.26	35	4.1
43	1.9	188	0	154	18	74	.10	.25	36	3.9
43	2.1	178	0	146	22	69	.10	.26	37	4.5
41	1.7	200	0	164	32	48	.10	.25	30	11
41	1.7	204	0	167	30	50	.10	.23	30	11
40	1.8	192	0	157	36	47	.10	.24	30	12
10,000	280	132	0	108	2,500	18,000	.70	60	1.5	.17
1.7	.10	18	0	14	1.5	2.5	1.1	.010	4.6	.03
1.9	.40	14	0	8	1.3	2.6	1.0	.010	3.7	.03
1.7	.40	13	0	11	1.3	2.6	.81	.010	4.4	.09
.30	.20	1	0	1	.99	.32	.04	.010	.03	.22
26	1.6	27	0	22	14	49	.10	.059	2.0	8.9

City of Daly City

Vista Grande Channel Water Quality Data

April 13, 1998

Sequoia
Analytical

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lo. San Mateo Co. Sani. Dist.
53 Lake Merced Blvd
aly City, CA 94015-1895

ttention: Patrick Sweetland

Client Proj. ID: -
Lab Proj. ID: 9804860

Sampled: 04/13/98
Received: 04/14/98
Analyzed: see below
Reported: 04/22/98

LABORATORY ANALYSIS

ab No: 9804860-01
ample Desc : LIQUID,Vista Grande Stormwater

nalyte	Units	Date Analyzed	Detection Limit	Sample Results
Arsenic by AA	mg/L	04/17/98	0.0050	N.D.
Cadmium by ICP	mg/L	04/15/98	0.010	N.D.
Chromium by ICP	mg/L	04/15/98	0.010	N.D.
Copper by ICP	**mg/L**	**04/15/98**	**0.010**	**0.012**
Lead by ICP	mg/L	04/15/98	0.10	N.D.
Mercury by Cold Vapor	mg/L	04/15/98	0.00020	N.D.
Nickel by ICP	mg/L	04/15/98	0.050	N.D.
Selenium by AA	mg/L	04/17/98	0.0050	N.D.
Silver: ICP	mg/L	04/15/98	0.010	N.D.
Subout			**SEE**	**ATTACHED**
Zinc by ICP	**mg/L**	**04/15/98**	**0.010**	**0.10**

lytes reported as N.D. were not present above the stated limit of detection.

QUOIA ANALYTICAL - ELAP #1210

van Kimyai
ject Manager

Sequoia
Analytical

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FAX (707) 792-0342

. San Mateo Co. Sani. Dist.
3 Lake Merced Blvd
ly City, CA 94015-1895

tention: Patrick Sweetland

Client Proj. ID: -
Sample Descript: Vista Grande Stormwater
Matrix: LIQUID
Analysis Method: EPA 8080,R-1
Lab Number: 9804860-01

Sampled: 04/13/98
Received: 04/14/98
Extracted: 04/17/98
Analyzed: 04/20/98
Reported: 04/22/98

Batch Number: 701321432
rument ID: GC-SEMIV

alyte	Detection Limit ug/L	Sample Results ug/L
drin	0.04	N.D.
mma-BHC (Lindane)	0.04	N.D.
lordane	0.14	N.D.
eldrin	0.02	N.D.
ptachlor	0.03	N.D.
xaphene	2.4	N.D.
B-1016	1	N.D.
B-1221	1	N.D.
B-1232	1	N.D.
B-1242	1	N.D.
B-1248	1	N.D.
B-1254	1	N.D.
B-1260	1	N.D.

urrogates	Control Limits %		% Recovery
butylchlorendate	50	150	101
trachloro-m-xylene	50	150	59

lytes reported as N.D. were not present above the stated limit of detection.

QUOIA ANALYTICAL - ELAP #1210

oject Manager

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o. San Mateo Co. Sani. Dist.
3 Lake Merced Blvd
aly City, CA 94015-1895

tention: Patrick Sweetland

Client Proj. ID: -
Sample Descript: Vista Grande Stormwater
Matrix: LIQUID
Analysis Method: EPA 8140
Lab Number: 9804860-01

Sampled: 04/13/98
Received: 04/14/98
Extracted: 04/17/98
Analyzed: 04/21/98
Reported: 04/22/98

Batch Number: 701321432
rument ID: GC-SEMIV

nalyte	Detection Limit ug/L	Sample Results ug/L
nlorpyrifos	0.7	N.D.
azinon	2	N.D.
sulfoton	0.7	N.D.
arathion methyl	1	N.D.

urrogates	Control Limits %		% Recovery
iphenylphosphate	60	150	88

ytes reported as N.D. were not present above the stated limit of detection.

QUOIA ANALYTICAL · ELAP #1210

ject Manager

lo. San Mateo Co. Sani. Dist.	Client Proj. ID: -	Sampled: 04/13/98
53 Lake Merced Blvd	Sample Descript: Vista Grande Stormwater	Received: 04/14/98
aly City, CA 94015-1895	Matrix: LIQUID	Extracted: 04/14/98
	Analysis Method: EPA 8270	Analyzed: 04/16/98
ttention: Patrick Sweetland	Lab Number: 9804860-01	Reported: 04/22/98

Batch Number: MS0409988270EXA
strument ID: F4

Semivolatile Organics (EPA 8270)

nalyte	Detection Limit ug/L	Sample Results ug/L
cenaphthene	5.0	N.D.
cenaphthylene	5.0	N.D.
nthracene	5.0	N.D.
enzoic Acid	10	N.D.
enzo(a)anthracene	5.0	N.D.
enzo(b)fluoranthene	5.0	N.D.
enzo(k)fluoranthene	5.0	N.D.
enzo(g,h,i)perylene	5.0	N.D.
enzo(a)pyrene	5.0	N.D.
Benzyl alcohol	5.0	N.D.
is(2-chloroethoxy)methane	5.0	N.D.
is(2-chloroethyl)ether	5.0	N.D.
is(2-chloroisopropyl)ether	5.0	N.D.
is(2-ethylhexyl)phthalate	10	N.D.
-Bromophenyl phenyl ether	5.0	N.D.
utyl benzyl phthalate	5.0	N.D.
-Chloroaniline	10	N.D.
-Chloronaphthalene	5.0	N.D.
-Chloro-3-methylphenol	5.0	N.D.
-Chlorophenol	5.0	N.D.
-Chlorophenyl phenyl ether	5.0	N.D.
hrysene	5.0	N.D.
ibenzo(a,h)anthracene	5.0	N.D.
ibenzofuran	5.0	N.D.
i-n-butyl phthalate	10	N.D.
,2-Dichlorobenzene	5.0	N.D.
,3-Dichlorobenzene	5.0	N.D.
,4-Dichlorobenzene	5.0	N.D.
,3-Dichlorobenzidine	10	N.D.
,4-Dichlorophenol	5.0	N.D.
iethyl phthalate	5.0	N.D.
,4-Dimethylphenol	5.0	N.D.
imethyl phthalate	5.0	N.D.
,6-Dinitro-2-methylphenol	10	N.D.
,4-Dinitrophenol	10	N.D.
,4-Dinitrotoluene	5.0	N.D.
,6-Dinitrotoluene	5.0	N.D.
i-n-octyl phthalate	5.0	N.D.
luoranthene	5.0	N.D.

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, San Mateo Co. Sani. Dist.
3 Lake Merced Blvd
ly City, CA 94015-1895

ention: Patrick Sweetland

Client Proj. ID: -
Sample Descript: Vista Grande Stormwater
Matrix: LIQUID
Analysis Method: EPA 8270
Lab Number: 9804860-01

Sampled: 04/13/98
Received: 04/14/98
Extracted: 04/14/98
Analyzed: 04/16/98
Reported: 04/22/98

Batch Number: MS0409988270EXA
ument ID: F4

alyte	Detection Limit ug/L	Sample Results ug/L
lorene	5.0	N.D.
xachlorobenzene	5.0	N.D.
xachlorobutadiene	5.0	N.D.
xachlorocyclopentadiene	10	N.D.
xachloroethane	5.0	N.D.
deno(1,2,3-cd)pyrene	5.0	N.D.
phorone	5.0	N.D.
Methylnaphthalene	5.0	N.D.
Methylphenol	5.0	N.D.
Methylphenol	5.0	N.D.
phthalene	5.0	N.D.
Nitroaniline	10	N.D.
Nitroaniline	10	N.D.
Nitroaniline	10	N.D.
robenzene	5.0	N.D.
Nitrophenol	5.0	N.D.
Nitrophenol	10	N.D.
Nitrosodiphenylamine	5.0	N.D.
Nitroso-di-n-propylamine	5.0	N.D.
ntachlorophenol	10	N.D.
enanthrene	5.0	N.D.
enol	5.0	N.D.
rene	5.0	N.D.
2,4-Trichlorobenzene	5.0	N.D.
4,5-Trichlorophenol	10	N.D.
4,6-Trichlorophenol	5.0	N.D.

rrogates	Control Limits %		% Recovery
Fluorophenol	21	110	44
enol-d5	10	110	31
trobenzene-d5	35	114	64
Fluorobiphenyl	43	116	56
4,6-Tribromophenol	10	123	93
Terphenyl-d14	33	141	71

ytes reported as N.D. were not present above the stated limit of detection.

QUOIA ANALYTICAL - ELAP #1210

ject Manager

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o. San Mateo Co. Sani. Dist.
53 Lake Merced Blvd
aly City, CA 94015-1895
tention: Patrick Sweetland

Client Proj. ID: -
Lab Proj. ID: 9804860

Received: 04/14/98
Reported: 04/22/98

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of_______ pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

8140 Note: Compounds reported on the 8140 were analyzed by method 8141 with additional compounds reported on this narrative.
See below:

Analyte	Results	Units	RL
Dimethoate:	N.D.	ug/L	2.6
Malathion:	N.D.	ug/L	1.1
Ethyl Parathion:	N.D.	ug/L	1.2

EQUOIA ANALYTICAL

'oject Manager

BioVir Laboratories, Inc.

685 Stone Road, Unit 6 · Benicia, CA 94510 · (707) 747-5906 · 1-800-GIARDIA · FAX (707) 747-1751 · WEB: www.biovir.com

REPORT OF SAMPLE EVALUATION

REPORT NO.: B980594A

PAGE NO.: 1 of 1

CLIENT ADDRESS:
Sequoia Analytical
680 Chesapeake Drive
Redwood City, CA 94063

CLIENT NO.: SEQ001

SAMPLE INFORMATION:

Name of Sampler: NA
Sample Source: Matrix L
Sample Location: Vista Grande
Sample Volume: 100 mL ea

Sample Date: 04/13/98
Sample Time: NA
Workorder No.: 9804860

ASSAY PERFORMED:

1. *Ceriadaphnia*: No *Ceriadaphnia* observed.
   Many *Euglena* seen.
   Many protozoans seen.
   Few Annelids seen.
   (Direct Microscopic Examination)

SAMPLE EVALUATION PERFORMANCE CRITERIA: The precise rates of recovery of organisms from environmental samples cannot be determined. BioVir Laboratories has analyzed your sample(s) in accordance with the method described with each analyte above, however, due to inherent limitations of these methods organisms may avoid detection. For additional information regarding the limitations of the method(s) referred to above please call us at 1-800-GIARDIA.

COMPANY IS NOT AN INSURER: BioVir Laboratories is not an insurer or guarantor of the quality and/or purity of water, wastewater, biosolid or other material from which the sample was taken. BioVir offers no express or implied warranties whatsoever concerning the quality or purity of any water, wastewater, biosolid or other material which is ultimately consumed, distributed, applied or otherwise disposed.

4-15-98
ANALYSIS DATE

John L. Riggs
SIGNATURE/DATE
4-22-98

Sequoia Analytical

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N. San Mateo Co Sani. Dist.
153 Lake Merced Blvd.
Daly City, CA 94015-1895
Attention: Patrick Sweetland

Client Project ID: -
Sample Descript: Vista Grande Storm H20
Analysis Method: See below
Lab Number: 9804860-01D

Sampled: 4/13/98
Received: 4/14/98
Reported: 4/20/98

STATIC PERCENT SURVIVAL BIOASSAY - NON RENEWAL

Species: Oncorhynchus mykiss
Common Name: Rainbow Trout

Organisms/Tank: 10
Organisms/Conc.: 20
Tank Depth: 16 cm
Tank Volume: 8 L
Supplier: Sticklebacks Unlimited/Thomas Fish
Acclimation Temp.: 13 °C +/- 1

Mean length: 35.0 mm
Mean weight: 0.28 g

Min. length: 33.0 mm
Max. length: 38.0 mm
Min. weight: 0.19 g
Max. weight: 0.33 g

Control Water: Synthetic Moderately Hardwater
Hardness 80-100

	Alkalinity mg/L	Hardness mg/L	Residual Chlorine mg/L	Conductivity µmhos/cm
Control	60	90	ND	260
100%	60	160	0.04	230

	Initial	24 Hr	48 Hr	72 Hr	96 Hr
DATE	4/14/98	4/15/98	4/16/98	4/17/98	4/18/98

	DO mg/L	C Temp	pH Units	DO mg/L	C Temp	pH Units	# M Dead	DO mg/L	C Temp	pH Units	# M Dead	DO mg/L	C Temp	pH Units	# M Dead	DO mg/L	C Temp	pH Units	# M Dead	Total Dea
Control	10.2	13.0	7.8	9.6	13.0	7.3	0	9.4	13.0	7.3	0	9.8	13.0	7.3	0	9.4	13.0	7.2	0	0
Control	10.3	13.0	7.8	9.5	13.0	7.3	0	9.3	13.0	7.3	0	9.6	13.0	7.3	0	9.2	13.0	7.2	0	0
100 % A	10.6	13.0	7.3	9.3	13.0	7.0	0	8.9	13.0	7.1	0	9.2	13.0	7.1	0	8.9	13.0	7.0	0	0
100 % B	10.6	13.0	7.3	9.2	13.0	7.0	0	8.9	13.0	7.1	0	9.2	13.0	7.1	0	8.8	13.0	7.0	0	0

96 Hour Percent Survival at 100% Concentration: 100 %

Remarks:

Analyst: M. Grislis

Method Reference: Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, 3rd Ed., EPA 600/4-85/013

SEQUOIA ANALYTICAL, ELAP# 1210

Kayvan Kimyai
Client Services Representative

CITY OF DALY CITY
AND
NORTH SAN MATEO COUNTY SANITATION DISTRICT
Chain of Custody Report for Analytical Services

9804860

Report All Data To:
City of Daly City
Department of Water and Wastewater Resources
Laboratory Operations
153 Lake Merced Boulevard
Daly City, CA 94015

Contact: Patrick Sweetland
Phone: (415) 991-8200
FAX: (415) 991-8220

I. SAMPLE TRACKING

Sample Collection

Date 4/13/98 Time 11:45 am

Collected By Karen Virulano

Laboratory Delivery

Date ____ Time ____

Delivered by ____

Special Instructions

5 day Turnaround
please fax results
to Patrick Sweetla

II. TURNAROUND STATUS (In Work Days)

__8Hr __1 Day __2 Days __3 Days __5 Days __7 Days __10 Days Other______

III. SAMPLE INFORMATION

Sample Description	Number/Type Containers	Analyses Requested 808
01 Vista Grande	1 - amber 2 l	— Chlorinated pest & PC
stormwater-	1 - amber 2 l	— PAH's
end of storm	1 - amber 2 l	8141 (~~extra~~) organophos.
	1 - plastic 1 l	8140 Organophosphate
	1 - plastic 1 l c̄ HNO_3	— metals
	1 - plastic 5 gallon	— bioassay-
		* trout (rainbow)
		& ceriadaphnia
		(growth + survival)

* trout 1st - if need more sample will collect for ceriadaphnia

Chain of Custody Information

Relinquished By	Received By	Date	Time	Comments
		4/14	9:a	
		4/14		
	Terri Downs	4/14	1155	

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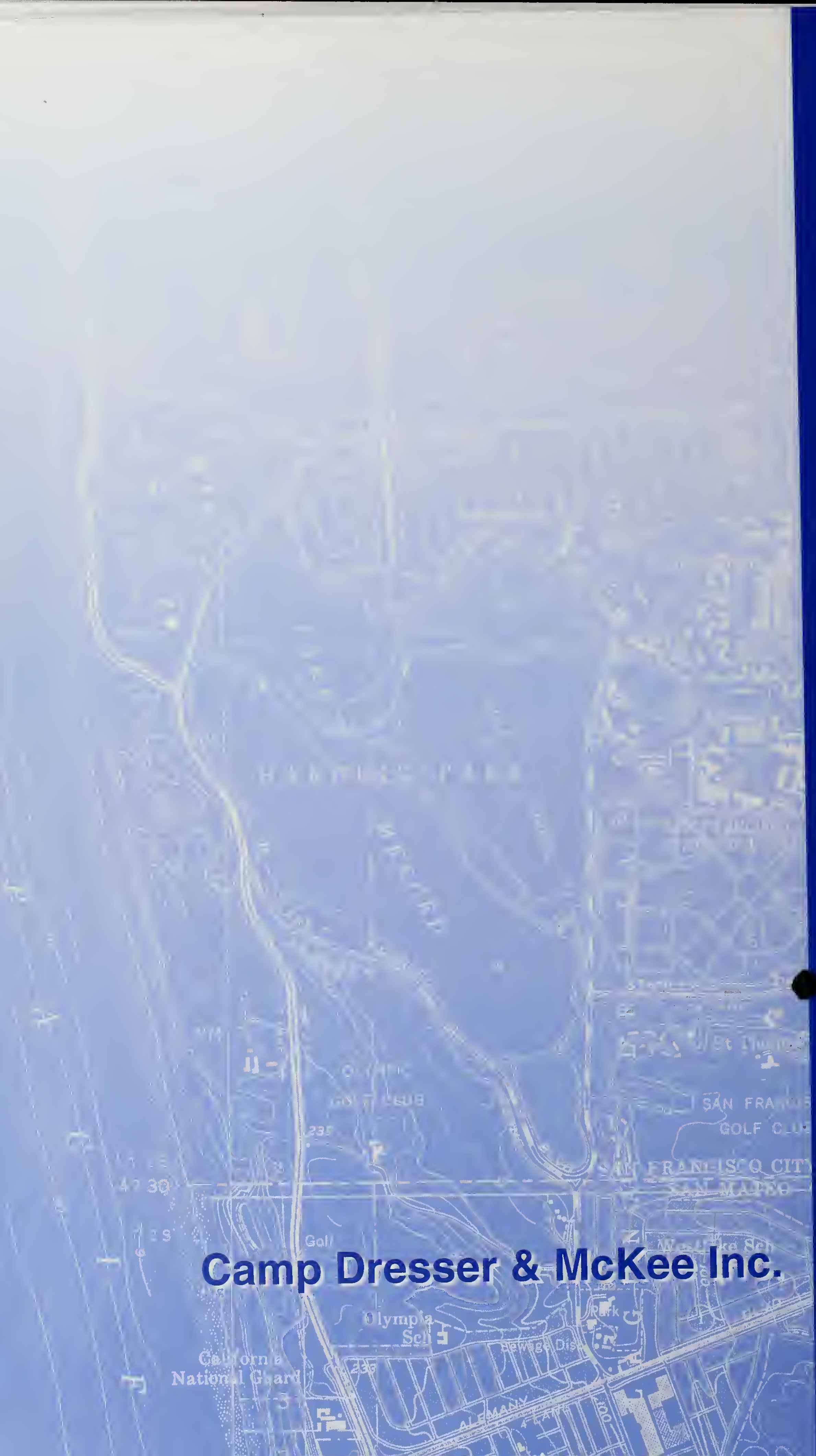

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